AVIATION WEEK
AUG. 18, 1947
INCORPORATING AVIATION AND AVIATION NEWS
A McGRAW-HILL PUBLICATION

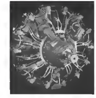
Air Mail by HELICOPTER

ANOTHER SIKORSKY FIRST

Transpartatian and cammunicatian take anather step farward with the award ta Las Angeles Airways af the first helicapter air mail rautes in histary.

Operating between the Las Angeles airpart and thirty past affices in nearby cammunities, these new rautes will save as much as 24 haurs in air mail delivery time.

Sikarsky S-51 helicapters will be used by Las Angeles Airways in bringing this faster service far air mail and gaads ta the Las Angeles area.



Vol 47

AVIATION WEEK

No. 7

INCORPORATING AVIATION AND AVIATION NEWS

McGRAW-HILL PUBLISHING CO., Inc. Publishing Office 99-129 N. Broadway, Albany, N. Y. Return postage guaranteed. Editorial and executive offices 330 W. 42nd St., New York 18. Chicago 520 N. Michigan Ave.; San Francisco 68 Post St.; Aldwych House, London W.C. 2; National Press Bldg., Washington, D. C.; Architects Bldg. 17th & Sansom Sts., Philadelphia 3; Hanna Bldg., Cleveland; 2980 Penobscot Bldg., Detroit; Continental Bldg., St. Louis; 1427 Statler Bldg., Boston; Rhodes-Haverty Bldg., Atlanta; 621 S. Hope St., Los Angeles; 738 Oliver Bldg., Pittsburgh. JAMES H. McGRAW, Founder and Honorary Chairman; JAMES H. McGRAW, Jr., President; CURTIS W. McGRAW, Senior Vice President and Treasurer; JOSEPH A. GERARDI, Secretary; NELSON BOND, Director of Advertising; EUGENE DUFFIELD, Editorial Assistant to President; J. E. BLACKBURN, Jr., Director of Circulation. Aviation Week 330 W. 42nd St., New York 18. Published weekly, price 50¢ a copy, 50¢ in Canada. Allow at least 10 days for change of address. Address all communications about subscriptions to Director of Circulation, 330 W. 42nd St., New York 18, N. Y. Subscription rates—United States and possessions $5 a year, $8 for 2 yr., $10 for 3 yr. Canada $6 for 1 yr., $10 for 2 yr., $12 for 3 yr., payable in Canadian currency at par. Pan American countries $10 for one yr., $16 for 2 yr., $20 for 3 yr. All other countries $20 for 1 yr., $30 for 2 yr., $40 for 3 yr. Please indicate position and company connection on all subscription orders. Entered as second class matter July 16, 1947, at Post Office, Albany, N. Y., under Act of March 3, 1879. Volume 47, Number 7. Printed in U.S.A. Cable address: McGraw-Hill New York. Member A.B.C. Copyright 1947 McGraw-Hill Publishing Co. Aviation Week is indexed in "Reader's Guide to Periodical Literature" and in "Industrial Arts Index." Following publications are combined with AVIATION WEEK: AVIATION, AVIATION NEWS, AERONAUTICAL ENGINEERING and AIRCRAFT JOURNAL. All rights to these names are reserved by McGraw-Hill Publishing Co.

THE AVIATION WEEK

THE CURTAIN FALLS—Like a Broadway extravaganza whose star has been taken ill, the Hughes investigation ended its run suddenly, and for somewhat the same reason—disappearance of the lead supporting player, John W. Meyer. That was the official reason, at least, although he could hardly tell the investigating subcommittee anything they had not previously learned from him in executive session.

Whether or not the investigation is resumed on Nov. 17—and there are few in Washington at this juncture wagering it will be—and despite its serio-comic overtones, the klieg lit show in the Senate caucus room has some deep implications being given sober study.

END OF VAUDEVILLE—Probably first and most important for industry in general is that right now Senators of both political faiths are in the mood to assure that there will be no repetition of the Hughes type inquiry. It evolved into a personal feud. Passing over the public standing of the duelists, the feeling is that the dignity and authority of the United States Senate was the innocent bystander that got hurt. Just what a congressional investigating group could do to prevent a publicity campaign by a person under scrutiny, these senators cannot decide.

Perhaps it will blow over, but at present there is an inclination to overhaul congressional investigatory procedures. In the future this might result in less of an opportunity for companies under investigation to state their cases publicly.

Just as likely, however, is a procedural change that would give those summoned before a congressional committee the same rights as their accusers to be represented by counsel and to call witnesses. One reason for Hughes publicity campaign was that he knew that under usual Senate investigatory procedure, he would not be permitted to state his case in his own way.

SUMMING UP—Summing up the results of the Hughes investigation, it appears to some observers that Howard Hughes succeeded in doing two things potentially of more importance that casting doubt on the truthfulness of Sen. Owen Brewster. One, with Elliott Roosevelt, he put on public parade the lack of faith in the judgment and ability of some Wright Field officers that is shared by scores of manufacturers and military flyers. Top-level officials of the industry have long resented the fact that Wright Field claims as its own, developments worked out by manufacturers. Two, Hughes put himself in the role of a man who only wanted to help his country and was prevented by the Army and aircraft industry, jealously working together.

Observers shudder at the thoughts of a further investigation to determine whether favoritism has governed the awarding of aircraft contracts.

BETWEEN THE ACTS—Sudden ending of the Hughes inquiry left a gap, an intermission in the drama of the aircraft industry in Washington. Next act will feature the air policy groups—the President's commission and the joint congressional committee. But neither is ready for curtain call. Next meeting of the President's commission is tentatively set for this week and with the selection of the executive director, the commission should be about ready to announce its method of procedure.

The congressional group, on the other hand, has given no indications of beginning organizational work. One of its key figures is Sen. Brewster who is on a month's vacation.

Quiet, too, is the status of the Air Force under the unification law. By mid-week, Secretary Forrestal had not taken the oath of office as Secretary of National Defense. Until he does, there is no separate United States Air Force. Until there is a USAF, the Air Force must live under the housekeeping of the War Department. Under these circumstances, the Air Force is like an involuntary guest who wants to go home and whose host won't let him.

TWO YEARS TO GO—Chief complaint of the War Department's guest is the help, or lack of it. Even while he was undersecretary, Secretary Kenneth Royall began drastic personnel cuts. He is still going strong. The Air Forces which has relied on the War Department for housekeeping purposes, sees some of the skilled people that have been trained by it and worked only for it slipping away.

That just makes the problem of organizing the USAF more complicated. That organizational task, it is now estimated will take two years to lick. At best, work has already begun on one of its main points: the budget. While AAF has in the past prepared its own budget to be included in the War Department estimate, the USAF budget is something else again.

NO CHANGE IN RESEARCH—Pre-occupied with their analyses of the Hughes investigation aircraft industry representatives in Washington gave little thought to the President's veto of the bill establishing a National Science Foundation. Their interest in it has not been as great this year as it was a year ago because the patent reform sections in last year's bill were not included this time. As the bill authorized the foundation but carried no appropriation, it would have given little immediate help to the industry's research aims.

NEWS DIGEST

DOMESTIC

S Paul Johnston, director of the Institute of the Aeronautical Sciences, has been named Executive Director of the President's Air Policy Commission

Howard H Rosenheim has resigned as civilian chief of the Army Air Forces industrial preparedness program at Wright Field to return to private industry in the Chicago area He is a former Air Forces major

Braniff Airways, which last November asked CAB to increase its mail pay to 20 cents a plane mile, has amended its petition in the still pending case and now seeks 30 cents a plane mile

Mid-Continent Airlines has asked CAB to amend its route 26 certificate to extend beyond Tulsa to Fort Worth Dallas The carrier also asks that Fort Worth Dallas be made an intermediate point on route 80

Pan American Airways reports a 98 per cent increase in passenger traffic between U S and Alaska in July over the same month a year ago.

FINANCIAL

Curtiss-Wright Corp reports a consolidated net loss of $241,837 for the six months period ending June 30 This loss is after applying tax carryback credits of $5,000,000 and after the transfer of $665,511 from post war conversion reserves Net sales were $38,687,453 and backlog is $130,000,000 Directors voted a $1 dividend payable on Sept 15 to stockholders on record Aug 22, to be paid out of previous earnings

Republic Aviation Corp reports a net loss of $476 205 for the first six months of this year after a tax carryback credit of $2,470 209. Sales for the period were $12,230,260 and unfilled orders amount to $70 000 000

Pacific Finance Corp, non-aviation subsidiary of Lockheed Aircraft Corp reports a $395,546 net income for first half of the year, equivalent to $1 06 per share Lockheed holds 95 per cent in this installment finance corporation

FOREIGN

Moscow Radio reports the opening of a new airline between Moscow and Kabul Afghanistan The 2500-mile route crosses 16 250-ft peaks in central Asia.

England has completed conversion of the corvette Marguerite to weather observer the first of four British weather ships to be maintained in the Atlantic The weather observer hull is painted black with yellow superstructure She will be stationed 300 miles west of Ireland to report weather and provide navigational and rescue service for aircraft

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INCORPORATING AVIATION AND AVIATION NEWS

Senate Probe of Hughes Ends Abruptly with Meyer Missing

Exclusive Aviation News story on TWA-Pan Am merger confirmed by sworn testimony of Hughes and Brewster

Senate War Investigating Committee's probe into the wartime contracts of Howard Hughes collapsed abruptly last week after two weeks of hearings failed to produce any evidence of fraud or collusion in procurement of the XF-11 photo reconnaissance plane and the HK-1 220 ton plywood flying boat.

Official reason was the failure of the committee to locate John Meyer, Hughes public relations man, who had already testified extensively in executive and public sessions, for further testimony. Hearings are scheduled to be resumed in November.

Hughes regarded the abrupt cancellation of the hearings as a personal vindication in respect to both his wartime contracts and his personal feud with Maine's Senator Owen Brewster (R.) over charges that Brewster used threat of investigation to attempt to push Hughes into a TWA-Pan American Airways merger and support of the community airline bill sponsored by Brewster among others. Brewster left Washington for Maine three days before the abrupt termination.

(Press Assn. Photo)

HOWARD HUGHES

▶ **Confirm Av News Story**—Both Hughes and Brewster, in sworn testimony, confirmed the exclusive Aviation News story of March 3 stating that conferences on the TWA-Pan American merger were under way between Hughes and Pan American officials. The story was widely denied.

Hughes said merger discussions began the week of Feb. 10 at a dinner in the Mayflower Hotel in Washington with Juan Trippe, PAA President. Hughes subsequently sent Noah Dietrich, executive vice president of Hughes Tool Co. to New York to confer with Trippe on the merger. Dietrich told Aviation Week that he had five separate meetings with Trippe. Dietrich reported to Hughes that it was not possible to "make an equitable deal" with Trippe and was told by Hughes to drop the matter temporarily.

It was after this decision, Hughes charges, that Francis Flanagan, assistant counsel for the Senate committee, turned up in Los Angeles and "started getting tough."

(Press Assn. Photo)

PAA HOUSE ON F ST.

▶ **Palm Springs Conference**—"Up to that time everything had been friendly," Hughes said. "I felt the timing was an application of the screws by Brewster after my refusing Trippe. I called upon Trippe and said there is no chance of our getting together unless we deal in person.

"Trippe said he could come to California and we had considerable discussions at Palm Springs in early April. During the course of these discussions I asked Trippe what he would do about Brewster. He said he would talk to Brewster when he returned and get him to hold up the investigation and hearings on the Community Company Bill until we got together. Trippe talked about Brewster as though he (Brewster) worked for him (Trippe)."

Hughes repeated under oath his charges that Brewster had "in so many words told me at luncheon in Brewster's suite in the Mayflower that if I would merge TWA with Pan American Airways and go along on the community company that there would be no further hearings in the investigation."

▶ **Brewster Denial**—Brewster denied the charges but admitted that he had partaken of Pan American hospitality at its house at 2017 F St. NW in Washington, at least to the extent of three ham and egg breakfasts with PAA Vice-President Sam Pryor during the past six months. He described the PAA house in detail and gave photographs of a luxurious house TWA formerly

(Press Assn. Photo)

NOAH DIETRICH

maintained in Arlington, Va. Brewster also admitted taking free rides in the Pan American executive plane to Raleigh, N. C., to confer with the late Senator Josiah Bailey on the Community Company Bill, from Atlanta to Hobe Sound, Fla., and then to Miami where he embarked on a trip around South America via PAA. Brewster produced a cancelled check to PAA for $2,028 dated Dec. 2 as evidence of his payment for the trip. His trip began late in November.

In evaluating opposition to the Community Company Bill, Brewster said that Jack Frye and the two Wilsons—T. B. and Arthur—were of lesser influence than C. R. Smith and Ralph Damon of American Airlines.

▶**Pan Am Investigation Question Mark**—Tom Slack, Hughes attorney, asked Brewster if he favored an investigation of Pan American Airways. Brewster agreed that the whole question of lobbying by airlines and other corporations "should be the subject of a searching inquiry." Brewster also indicated he thought the award of overseas routes by the Civil Aeronautics Board could bear official investigation.

Hughes cited two stories from AVIATION NEWS as alleged evidence that Brewster was putting pressure on him to support the Community Company Bill in Washington last spring. Partial transcript of a telephone conversation between Hughes in Los Angeles and Brewster in Washington regarding the AVIATION NEWS story of March 3 was also introduced in the testimony. Hughes said the AVIATION NEWS story produced a flood of press queries and that he eventually denied the TWA-PAA merger because "it put the whole TWA organization into a spin."

Strike Threatens Halt At PAC Center

Pacific Automotive Corp. may close its important Oakland, Cal., engine overhaul center as the result of a jurisdictional strike that already has resulted in 105 workers being paid off.

A dozen supervisory employees last week were passing picket lines to complete the assembly of 27 airline engines that were in work process when the strike was called by International Association of Machinists. All other engine overhauls are being diverted to the company's home plant and main overhaul facility at Burbank, Cal.

Unusual aspect of the strike is that it resulted from IAM's apparent success in converting virtually the entire membership of an independent union holding a PAC contract, Amsco Employees, Inc.

In preliminary conferences with a U. S. labor conciliator, PAC has insisted that even though IAM evidently holds complete command of all or most of 105 shop workers, the existence of a contract with Amsco prevents the company from bargaining with IAM.

Hughes Vs. Wright Field

Evidence of long-smoldering antagonism between planemaker Howard Hughes and what Hughes termed "the clique at Wright Field," lead by Maj. Gen. Oliver Echols, now AIA president, flared at the closing session of the Senate War Investigating committee hearings on Hughes' $18 million flying boat and $22 million reconnaissance plane contract.

Hughes reiterated a charge, previously made by Noah Dietrich, Executive Vice President of Hughes Aircraft, that Echols barred Hughes from participating in the wartime aircraft program because of "personal dislike." He quoted Echols as stating that he "would never be a party to a deal with Hughes," added that "this feeling was prevalent throughout Wright Field," and commented "that is the reason I had one percent of the war plane contracts" and wound up with 100 percent of the investigations.

The three factors which piqued Wright Field officials, Hughes said, were (1) his failure to stop off at Wright Field as promised in 1937 after making transcontinental record breaking flight; (2) the refusal of his assistants (which Hughes said he regretted) to permit Gen. H. H. Arnold to inspect his D-2 prototype being constructed privately because of Wright Field "brush offs" to a previous plan and (3) his failure "to extend hospitality to AAF officials as other manufacturers did" created the impression among Wright Field officers that he was "a rich man who hid out in Hollywood and considered himself above associating with them." As a result of this feeling Hughes said he hired Johnny Meyer as his public relations man.

AAF Begins Tests With Bell XS-1

Bell proposes slow approach to supersonic.

Army Air Forces last week began new flight tests of the Bell XS-1 with Capt. Charles Yaeger as pilot. As soon as Yaeger completes a series of familiarization flights, a first attempt will be made to push the plane to supersonic speed. Under Army contract terms, Bell Aircraft's XS-1 pilot, Chalmers Goodlin, held the speed of the rocket plane to slightly over Mach .8.

If Army follows a procedure proposed by Bell Aircraft approach to supersonic flight will be made in a series of uniform steps. R. M. Stanley, Bell vice president of engineering, suggested that high-speed flights begin with a level flight at Mach .8 for 154 seconds on one rocket tube followed by a climb at 4 deg. using all four rocket tubes until fuel is expended.

▶**Climb Best Position**—During the 45 deg. climb the pilot would be in the best possible position either to cut power and retreat or "stretch his luck if the plane should begin an anticipated "tuck under" in the vicinity of Mach 1.

Succeeding flights would be made with a shorter initial flight on even keel and gradually extended climb at 4 deg. Should no unfavorable results obtain, a final "all out" phase would call for a near-vertical climb at full power immediately after launching from the B-29 mother.

▶**Mach 1.35 Goal**—Stanley told members of the Institute of Aeronautical Sciences meeting in Los Angeles that the present XS-1 should be able to attain a mach reading of 1.35 in a 45 deg. climb. With turbine pumps feeding the rocket motors, the plane's designed speed would be close to 1500 mph.—approximately mach 2.

While some consideration has been given to attempting transonic flight under a zero lift condition by having the XS-1 describe a gradually increasing dive, Bell officials favor the 45 deg. climb procedure as one that will give the pilot uniform time and performance check points during successive flights.

Bell's high speed test phase has to have taken approximately six months. How closely the plane may approximate designed performance estimates may not be learned, with a new pilot at the controls, until next spring. XS-1 performance originally was calculated in startling terms before the proposed turbine pump fuel feed was shelved temporarily in favor of the somewhat less efficient nitrogen pressure feed now in the airplane.

The XS-1 theoretical climbing speed was estimated to be 120,000 ft./min. at an altitude of 120,000 ft. or close to 1400 mph.

AVIATION CALENDAR

Aug. 19—International Air Transport Association financial committees, Paris.

Aug. 21-28—West Coast transportation and maintenance meeting, Society of Automotive Engineers, Biltmore Hotel, Los Angeles.

Aug. 25—International Air Transport Association financial accounting and statistical subcommittee, Paris.

Aug. 25-27—Second annual WASP reunion, Ponca City, Oklahoma.

Aug. 26-29—Fall general meeting, American Institute of Electrical Engineers, San Diego, Calif.

Aug. 28—International Air Transport Association, financial clearing house subcommittee, Paris.

Aug. 30-Sept. 1—National Air Races, Cleveland, Ohio.

Sept. 1-4—Fall meeting, American Society of Mechanical Engineers, Salt Lake City.

Sept. 1-12—International Air Transport Association technical conference, Nice.

Sept. 8—International Air Transport Association financial committee, Brussels.

Congress Leaves Better Record on Aviation Bills

Separate air force biggest achievement of first session of 80th Congress. Truman vetoes Research Foundation.

The first session of the 80th Congress wrote a mildly progressive record in aviation, with two major accomplishments—because of their fundamental importance to a vigorous airpower program—offsetting many of the things left undone.

Legislation unifying the armed services and correlating national defense with industrial mobilization and foreign policy, bitterly opposed by the politically potent Navy Department for the past decade, was enacted. When the President affixed his signature to the measure establishing an overall national military establishment, the air force for the first time was given co-equal status with ground and naval forces.

Although some view the unification measure a bureaucratic grouping of three separate services—departments for Air, Navy, and Ground forces—under an over-all agency to give a semblance of integration, the measure, at a minimum, is the basis from which real armed services integration can evolve.

Credit for enactment of the unification measure goes largely to Sen. Chan Gurney (R., S. Dak.), chairman of the Senate Armed Services Committee. Gurney pushed the measure through, when opposition of congressional naval spokesmen, coupled with a jammed agenda appeared to have blacked-out its chances.

Legislation setting up a National Research Foundation—backbone for an aggressive program of research in aviation and other fields—after arduous work by its sponsors, led by Sen. Alexander Smith (R., N. J.), was approved, only to meet with a White House veto. The measure had been left to die by the 79th Congress. Outlook for re-passage of a revised version of it in the next session is dark.

Certain aspects of the performance of this Congress on aviation matters lend themselves to criticism, but taken all-in-all compromise a commendable record, particularly by comparison with the records of previous congresses.

Appropriations for the Military and Naval aviation programs buffeting the United States foreign policy were skeptically scrutinized and trimmed. They were not heavily slashed, as widely anticipated, in the all out drive of Republican Congressmen to effect economy in government.

▶**AAF Boost**—AAF was awarded a $1,259,272,000 appropriation—substantially more than last year's $1,064,500,000. Navy's Bureau of Aeronautics fared less happily. Its $748,000,000 appropriations was below last year's $780,760,000. Indicative of the Congressional intent to back vital national defense programs with funds was the fact that the $75 million proposed by the budget bureau for BUAER's research and development program, and the $145 million proposed for AAF research were untouched by the Congressional economy ax. In addition, the $43 million voted for National Advisory Committee for Aeronautics was $12 million more than last year's allocation.

Heaviest blow to aviation probably was the session's action in slashing $70 million off proposed appropriations for CAA and reducing the administration's budget to $119 million, or $5 million below last year's allocation. The Congressional action on CAA was prompted by skepticism of its administration specifically, the mounting ratio of its administrative and other "non-productive" personnel to the size of its program and to the number of operating personnel.

▶**Angry at CAA**—Impatience over CAA blunderings, failure to push war developed radar, and lack of cooperation with the military on a uniform national air safety program accounted, in large measure, for the ruthless slash of $17 million made in CAA funds for new safety facilities. This left the Administration $11 million for its 1948 fiscal year program.

A disapproving view was taken on the "subsidy" rates set for airmail by CAB. But both the board and the Post Office department were cleared of responsibility for the situation, and promise was made for legislation changing the method of airline subsidization. CAB was given a $3 million appropriation ($500,000 over last year) to catch up on its overloaded agenda.

Both houses devoted months of effort on hearings on the already thoroughly-aired chosen instrument proposal. Legislators in both houses so decisively rejected the plan that its advocates withdrew their fight. This leaves the proposal unconclusively defeated, with its proponents poised to revive it at an opportune time.

▶**Major Failing**—The major failing of the first session of the 80th Congress was what it left undone. Important aviation measures—some of them in the last lap—were left incompleted.

The Armed Services Procurement bill—bringing order out of the chaos of overlapping and conflicting procurement regulations of half a century and paving the way for negotiated contracts for aircraft development and research—missed Senate approval in the last minute rush. It will probably be passed the first day of the new session. The same thing happened to the bill removing the Vinson-Trammel Act's outmoded provisions stipulating 12 percent profit ceiling on military and naval aircraft and requiring the Navy to obtain 10 percent of its aircraft from government plants.

▶**Left Agenda**—Congress adjourned without considering numerous measure vital to the nation's science program—authorizing an increase in NACA personnel to 17 members,

WHITE HOUSE ADVISERS

Presidential Air Policy Commission at first meeting seated, left to right: George P. Baker, vice chairman, Thomas K. Finletter, chairman; Arthur D. Whiteside. Standing, left to right, E. P. Hoyt and Henry Ford II. (Press Ass'n photo)

authorizing the War and Navy Departments to dispatch personnel to private plants and institutions for training, authorizing AAF to establish a research advisory committee and promoting cooperation between the AAF and private industry on developmental work

The bill authorizing the War and Navy Departments to hire 45 civilian scientists at from $10,000 to $15,000 a year, however, was enacted. Legislation establishing a clearing house in the Commerce Department to promote the dissemination and utilization of scientific data by small businesses has approved by the Senate Committee on Executive Expenditures, but adjournment blocked further action.

The War and Navy public works bills, approved by the Senate Armed Services Committee, were left for action next year. They carry authorization for a $459,000,000 program of domestic facilities and $200,000,000 for overseas installations, including a $34,000,000 development at the Point Mugu missile testing center and $26,000,000 for an aero turbine laboratory at Trenton.

The session puttered with domestic air transport legislation. A few hearings were held on the McCarran omnibus bill setting up an independent civil aeronautics authority. But the problems requiring legislative solution in the domestic transport field—such as that of multiple taxation—were pushed aside for the chosen instrument show. Numerous omnibus bills (re-writing the 1938 CAA Act in the light of recent developments) were introduced—the McCarran and its companion in the House, the King bill, the omnibus Wolverton bill reorganizing CAA and CAB and laying down a policy emphasizing maximum competition instead of regulated competition, the omnibus Brewster bill, following the lines of the Wolverton bill. Action on bills establishing independent air safety board fizzled under the opposition of both the air transport industry and the Commerce Department.

202 Certified

The Martin 202 has been approved by the CAA for airline service the first postwar twin-engine transport to pass the new, more rigorous CAA certification tests. Approval was granted followmg a meeting of the Region 1 type certification board.

This approval, in the form of a recommendation to CAA headquarters has been forwarded to Washington and barring unforeseen objections will result in the award of an approved type certificate for the airplane. Current airplanes carry tentative certificates permitting the use of NC licenses on the tail. First 202 has received an "NC 93002" license.

Industry Observer

► **McDonnell's new Navy fighter will abandon the wing root location of turbojet units in favor of the lower-drag installation of twin turbojet units in the fuselage belly.**

► Pratt & Whitney may abandon its AAI compound engine development project by mutual agreement following extensive difficulties and rising experimental costs. Although the compound engine (turbosupercharger geared back into engine drive shaft) offers fuel consumption as low as .35 lb. per horsepower hour (compared to .45-.60 for reciprocating engines) development problems have proved far more complex than even realistic appraisals two years ago. Wright Aeronautical is said to be having the same degree of difficulty on a similar project. Both companies are now dubious of the eventual commercial market for such an engine.

► **Piper Aircraft Corp. reveals that a Cub fuselage costs $90.74 for materials as against $53.26 for a metal structure. Fabrication of the tubing-fabric composite structure requires 20.51 manhours as compared to only 11.20 for a similar metal fuselage.**

► Boeing Aircraft is shooting for a $1,500 price tag on its new lightweight turbojet, although engineers feel that this figure may be two years off pending further design for production. Personal aircraft manufacturers are definitely eyeing the engine for future design purposes.

► Howard Hughes reveals that difficulties with the control power boost system of the HK-1 is the major delaying factor in the initial test flight of the giant flying boat. His system uses power boost as the sole control method in contrast to the direct mechanical override system used on all other power boost systems as an emergency safety measure.

► Lockheed Aircraft Corp. is preparing to produce for other manufacturers and wind tunnel operators its "Beman Weaver Bump" used to obtain transonic airflow in subsonic wind tunnels. Company feels it can be of service to the industry in saving time and engineering costs others would be forced to spend in attempting duplication of the device.

► Braniff International Airways, first commercial airline to get CAA approval for ILS approaches on its regular schedules, is happy over initial use of the VHF radio beam system. During first 10 days of operations Braniff completed five schedules using ILS that would have otherwise been canceled due to weather below minimum for standard radio range approaches. In one case Braniff and Eastern flight were approaching San Antonio at about the same time when the weather went below radio range approach minimums. Eastern had to return to Houston while Braniff made an ILS approach and landed on schedule at San Antonio.

► Senate War Investigating Committee, which was highly concerned over $21,000,000 cost of the Hughes 200 ton HK-1 plywood flying boat is apparently unduly naive on the cost of experimental aviation. Lockheed estimates the first Constitution cost $27,000,000. Initial B-36 cost over $30,000,000 while the first two B-35 experimental Flying Wing models cost about $26,000,000 without engines, radio equipment or armament.

► Speed gains from thermal deicing systems will probably be slight and disappointing in contrast to the 20 mph speed boost originally claimed by United Air Lines as a result of hot wing deicing tests on a Douglas DC-6. Test project set up by Douglas to check the United reports confirmed speed increase when thermal deicing system was turned on but indicated it would not exceed one to two mph. Douglas will continue project until the increase is completely evaluated.

► AAF is working on a plan to divorce all military air traffic in the Washington area from CAA traffic control and handle it with new radar traffic control equipment now operating at Andrews Field. AAF action was stimulated by a recent 4 hr. delay in the CAA instrument "stack" over Washington on a top ranking AAF general. The Andrews Field radar traffic control system—CPN-18—has been flight tested at AAF's All Weather Flying Center, Wilmington, Ohio, where it controlled and landed 45 planes an hour without approaching a saturation point.

► **The long range—125 mi.—search radar installed last march at Washington National Airport is still used only by AAF. CAA, which announced it would use the set to monitor traffic in the Washington area, has not yet installed remote scopes in its airways traffic control center. Similar long range radar installed by Airborne Instruments Laboratory, Inc., will transmit its scope data to La Guardia Field traffic control center by microwave relay. Biggest problem in use of search radar for traffic control is positive identification of individual aircraft. AAF uses a small coded radar transmitter that makes a distinctive blip in the radar scope. Commercial aircraft are not equipped for positive radar identification.**

Defensive Air Patrols Urged By Gen. Kenney for U. S. Frontiers

Strategic Air Force commander recommends radar-equipped B-36 search missions as best aerial defense; predicts long-range fighter development.

By ALEXANDER McSURELY

An aerial coast guard, comparable in theory to surface coast guard operations, but using long range patrol planes operating several hundred miles around the boundary of the U. S. should be promptly established as a war preventive measure in the opinion of General George C. Kenney commanding general U. S. Air Force Strategic Air Command, Andrews Field, Md.

"A handful of very long range planes like the new B-36s could do the job with radar search equipment. Each plane could stay out on patrol two or three days at a time. Their assignment would be to detect any aerial movement toward the U. S. no matter from what quarter, and to identify it. If identity were not quickly established, the patrol would call out a mission of fast fighters from the nearest base to challenge the intruder. Surface vessels now are subject to coast guard regulation. But anybody can fly into the U. S. unchallenged unless he happens to land at an airport which is a port of entry. The very existence of such an aerial patrol would be a strong deterrent to any other nation's schemes for attacking this country," Gen. Kenney pointed out.

Gen. George C. Kenney

Replying to a series of questions in an exclusive AVIATION WEEK interview, the SAC commander, recognized as one of the ablest air strategists in World War II and now leader of the nation's first line shock troops of the air, gave his views on future trends in aerial war.

Gen. Kenney forecasts:

● **Early Use** of effective long range guided missiles is not likely either against or by the U. S. It may be 20 years away, although this time could be shortened by earlier developments of more powerful propellants.

● **Pending Perfection** of such weapons far beyond their present status future air war will use the very heavy long range bomber as its principal striking weapon. Immediate successors to the present B-29 Superfortresses will be the B-50 (an improved B-29) the four engine pusher flying wing B-35 and the six-engine B-36. Others are in development.

● **Very Long Range,** high speed fighters will provide additional protection to the bombers beyond what their own armament can give. The fighters will have multiple crews, will be heavily armed and radar equipped. Tactical problems involved in using the new experimental parasite fighter designed to be carried by a bomber, make the independently-operational long range fighter preferable.

The stocky, aggressive Kenney is a long time disciple of air power who as long ago as 1935 served as chief of training and operations of the old GHQ Air Force, predecessor of his present command, then headed by Gen. Frank M. Andrews, for whom Andrews Field is named.

► **Observer In France**—Kenney was U. S. Army Air Corps observer in France in 1940 where he made recommendations leading to drastic revisions of American warplane specifications for heavier armament, armor plate and self-sealing tanks. Later as MacArthur's air commander in the Pacific, he made telling use of a small air force against numerically superior enemy formations until reinforcements made possible an air offensive which played a vital part in the ultimate victory.

He considers the men in his SAC B-29 crews as better trained and more efficient than veteran wartime crews, although he admits it took a stiff program of training missions to build up his command to its present efficiency after the points system brought about discharge of many of the best AAF personnel.

► **Long Distance Training**—Recent long range flights by B-29s to Europe and Tokio are examples of the training missions Air Force Day B-29 demonstrations including the one-stop flight from Tokio by seven out of eight B-29s, help to keep up the command's efficiency record. The Tokio planes flew over the Washington Monument exactly on schedule at noon Aug. 1.

► **Monthly Flights**—Each month a squadron of B-29s goes to Tokio to relieve another squadron on duty there. The long flights and experience of maintaining planes under field conditions give valuable training to the crews.

► **Views on Missiles**—Explaining his view on the prospect for long range missiles, Gen. Kenney points out that a major deterrent to early use of long range rockets is the immediate stripping of many parts of the world. No matter how accurately a missile was directed according to best available maps for many localities, it might land miles away from the target because of map inaccuracies. If the missile was radio-controlled from a home base, the control might be overpowered by stronger radio controls near the target after the missile passed the halfway mark and might be diverted.

But the major immediate drawback to the missile is the amount of propellant required to carry even a small explosive load for a distance of—for example—5,000 miles. It would take an apparatus at least as large as the B-36 to carry propellant and warhead on such a mission. And it would take an expenditure of billions in rocket research over a period of several years to develop even a prototype missile of such range, Gen. Kenney believes.

► **Escort Fighters**—Asked to expand his views on long range escort fighters the SAC commander pointed to the recent long range flight of the P-82 from Hawaii to New York as an example of what present day fighters are capable of doing. Relief pilots and radio operators will be necessary for the new longer range escort planes and they will be designed for speed and range primarily, rather than maneuverability as a fighter characteristic insignificant as compared to speed and range.

Gen. Kenney is doubtful of the value of the projected tiny parasite fighters because of difficulties of retrieving the planes after their small amount of fuel is used. If combat continues the bomber which slows down to "latch on" to a spent fighter, is in jeopardy, it would be difficult for a fighter pilot to find the "mother" plane which he had originally left, and if he hooked on to another, he would be taking the place of another parasite.

The SAC chief expects centralization and elimination of overlapping and duplicating functions made possible by unification of the armed forces will pay off eventually in better national defense at a more efficient operating cost.

Like other air force leaders he is not happy about drastic peace-time curtailments in funds available for the U. S. Operational Air Force in being, and the dim prospects for future new plane development funds.

► **Squadrons Ready**—His existing fighting force is on operational status. In other words he could have his full complement of B-29s the heavy bomber striking force, in the air on a combat mission, within a maximum of four hours, allowing only time for fueling and arming the planes.

Merged Dutch Plants Tackle New Planes

Fokker, Aviolanda, and De Schelde in government sponsored combine.

AMSTERDAM—The Dutch aircraft industry has suffered heavily during the war. Fokker sustained severe bombing and looting damage. The Koolhoven works were completely destroyed. The Aviolanda (Papendrecht) and the aircraft department of De Schelde Shipyards (Flushing) have remained intact.

It was logical in a small country like the Netherlands that soon after the liberation a merger of all aircraft works was contemplated. Koolhoven decided not to rebuild. De Schelde, with a view to the coming merger, likewise decided to stop aircraft production, though bringing its equipment in the new combine Fokker Aviolanda and De Schelde concluded a merger into the 'United Dutch Aircraft Factories Fokker.'

▶ **Government Sponsored**—The government sponsored the merger. In fact the government made merger a condition for financial help and participation, also with a view to stimulating the rebirth of a powerful aircraft industry by means of development orders for new types.

The merger has been operative since Jan. 1, 1947 though the articles of association are still being worked out and the capital has not yet been fixed. It is a foregone conclusion that government participation will be a minority interest. A new up-to-date combined factory situated near an aerodrome has been planned and its location will soon be determined.

The program of the merger and the new large factory is to build aircraft of own design and under foreign license. For the present production is concentrated in the rebuilt Fokker factories at Amsterdam the small Aviolanda works confining themselves for the time being to the construction of buses and the repair of naval aircraft.

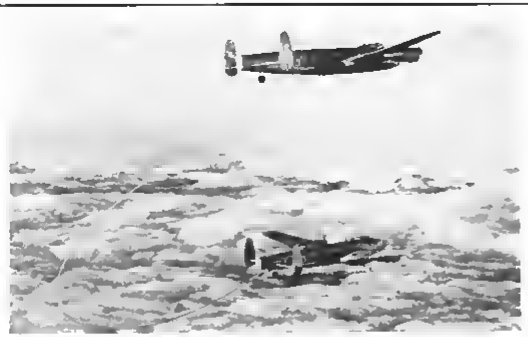
Fokker has been fortunate in being able to acquire soon after liberation new tools and machinery from Switzerland, U. S. and Czechoslovakia and is again actively at work with approximately 2,000 mostly skilled workers.

At the moment Fokker is producing several planes of their own design.

▶ **Conversions Important**—Conversions form another important part of the present program. They include all kinds of aircraft, especially Dakotas and Skymasters. Fokker has won a reputation in this respect for solid and efficient work and in particular for speedy delivery. Orders are coming in not only from the KLM but from many countries including Yugoslavia, Finland, France, Portugal, Great Britain, Belgium, Sweden and Norway. Owing to a foreign exchange grant Fokker is in a position to deliver spare parts with the converted aircraft, a great advantage to clients.

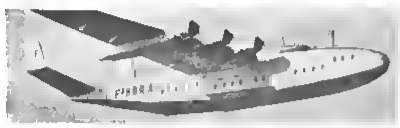
Maintenance, overhaul and repair naturally constitute another portion of daily routine work, especially of "Harvards," "Hudsons," "Fireflys," "Airspeeds" and "Oxfords" of the Dutch army and navy airforces.

To conclude the intended technical (and partly financial) combine between Fokker and the American Beech Aircraft has been shelved. Factors of practicability have apparently developed putting a spoke in the wheel of the negotiations. This is to be regretted, because it would be a great advantage for an American aircraft factory to have a pied a terre in a quiet and stable country like Holland, while the Dutch aircraft industry would have benefited by American experience.



AIRBORNE SERVICING

Seeking to get additional range with existing aircraft, British have resumed refueling in-air experiments. By use of this technique, a converted Lancaster bomber recently flew nonstop from London to Bermuda, taking aboard 3,400 gals. of gas in flight. Photo shows a practice refueling operation before the Bermuda flight.



FRENCH FLYING BOAT FOR OCEAN SERVICE

Designed in 1938, Latecoere 631 is only now proving out. Construction of prototype was halted by war, and designs and parts were hidden from Germans. Work was resumed after liberation and four have now been completed. Photos show Number Four at recent demonstrations in England. Powered by six Wright R-2600 engines each developing 1,600 hp. at takeoff, boat cruises at about 185 mph. Span is 188 ft., length 142 ft., gross weight 157,300 lb. and weight empty 71,280 lb. Wing floats retract into outboard engine nacelles. Of a total of ten 631s to be built, Air France will put three into South Atlantic service. In long-range version it will accomodate 46 passengers. Up to 100 may be carried for a range of about 1,000 mi. (Aeroplane photos)

Army-Navy Research Will Probe Supersonic Sickness

Volunteer airmen subjected to jet engine noise at experimental station; Wright Field has ambitious project

Possible effects on aircraft workers of the high frequency vibrations emanating from jet engines may still be determined by research although the manufacturing industry turned down a proposal for such an investigation at its recent west coast meeting. Both the Army and the Navy have separate programs which may supply answers to many of the questions puzzling West Coast engineers in particular.

At the Naval Air Experimental Station Philadelphia, the experiments take the form of subjecting nine volunteers to the noise of a jet engine in a test cell, with medical examinations following as they leave the cell.

▶ **Wright Field Project**—At Wright Field the Air Force is undertaking a seemingly more ambitious project with the construction of an ultrasonic chamber expected to be ready the end of this month. Here the effect of humans of vibrations up to 200,000 cycles per second will be tested.

Possibility that high frequency vibrations above the range of audible sound (20,000 cycles per second) were injurious to health was noted during the war by the Germans in their jet engine work. Later, both the Army and Navy studied the matter. Last spring a mention of supersonic sickness came from employees of Britain's De Havilland Company. AVIATION WEEK, July 14 reported that the ailment was believed to have been manifested in at least one west coast company.

▶ **Temporary Deafness**—So far, it seems definite that the supersonic vibrations will produce temporary deafness. Other impairments are only suspected. It is known that high frequency vibrations from a jet engine will homogenize milk, break down the chemical components of mercury, and sterilize bacteria. Tests with animals and humans have shown that the vibrations affects pulse rate and blood pressure. Whether they can cause lasting nervous disorders and nausea—as has been alleged—may be determined by the Wright Field experiments.

According to Dr. Horace O. Parrack, research physiologist at Wright Field's Aero Medical Laboratory, single frequencies will be tested at a time to find out whether high or low frequency vibrations, singly or in groups, have the most harmful effects.

The equipment is mounted in a 20 by 30 ft. basement room at the laboratory. Inside the room is another wooden room about 15 by 20 ft. This is soundproof and "anechoic," or non echoing.

A 250 hp. electric engine turns up an aircraft type supercharger which compresses air. The air drives the rotors in a siren, about 4 ft. in diameter, which sets up the vibration in the small room.

The 'horror chamber' will be ready for its first test about the end of this month, with Dr. Parrack probably being the first "victim." "Sort of an unwritten law you know that we scientists try out the things we perfect," he says.

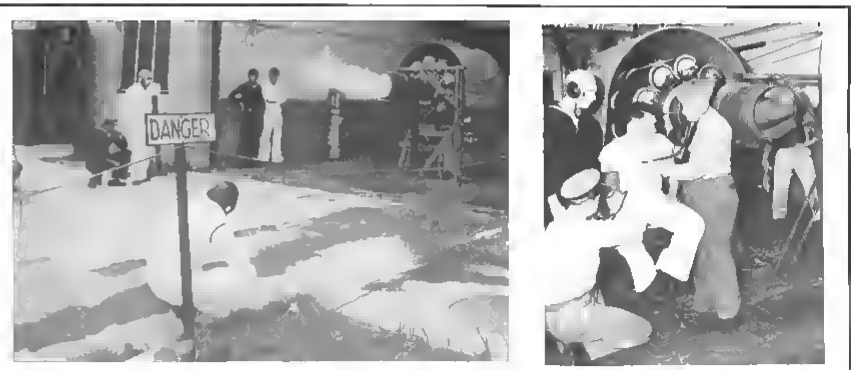
Throughout the range of audible sound the whirring rotors will quite literally be capable of reducing a person to a state of frenzy under prolonged subjection. The bearable level of noise about 130 decibels can be surpassed by this machine.

Past the audible range the machine will lapse into silence except for the background of motor hum—and what the effect will be of these ultra-high frequency silent vibrations remains to be discovered.

As this research is concerned with the whole general range of sound, Dr. Parrack intends to reproduce noises from aerodynamic vibrations of a plane to generator noise and simple rattles.

Aiding the AAF physiologist in the project have been 4 or 5 German scientists. The Germans were making considerable studies in the field of sound when the war came to an end.

The Army believes this is the most advanced sound chamber ever constructed. It is complete with various analyzer instruments including a frequency counter, which is like the panadapters used for indicating radio waves.



Continuing efforts to determine effects on human beings of high frequency vibrations emitted by jet engines (AVIATION WEEK July 14). Naval Air Experimental Station at Philadelphia has started tests with nine enlisted men who volunteered. With special helmets protecting their eardrums from blast effect of noise, men remain near the engine for an hour. Then they are examined by doctors as they leave test cell. While temporary deafness has been attributed to noise of jet engines, extent to which vibrations affect nervous system has not been decided. (TNP photos)

Sunderland Resigns As Edo Sales Chief

Frank Sunderland, advertising and sales promotion manager of Edo Aircraft Corp., has resigned effective Sept. 1. He has not yet announced his future business plans.

He took over the Edo job two years ago and directed the promotional program that assisted in pushing last year's sales to six times the prewar volume. Current sales are ten times as high as prewar.

In other personnel actions:

• **McCullough Motors Corp.**, Los Angeles, appointed C. F. Breer, sales manager. He has been assistant sales manager.

• **Air Associates, Inc.**, shifted Willard Walpole, Dallas branch manager, to Los Angeles as manager of that branch. Jack L. Beard, now in Seattle, moves to Los Angeles as sales manager of the LA branch's manufacturing division. Replacing him in Seattle will be John Morrow, now in the LA branch. Norman Bjornsen has been named purchasing agent for the Teterboro division. He formerly was buyer for the manufacturing division.

• **B. F. Goodrich Co.** appointed Willard C. Gulick, president of International B. F. Goodrich Co., succeeding Stanley W. Caywood, retired. He formerly was general sales manager of the export division.

• **General Electric Co.** announced the retirement of Waverly A. Reeves of the Aircraft Gas Turbine Engineering division. Associated with GE since 1904, Reeves assisted the late Dr. Sanford Moss in developing the first aircraft turbo supercharger.

• **Aircraft Screw Products Co.** elected Alfred Merchey to the board of directors. He formerly was president and chairman of the board of Republic Aviation Corp.

• **Nylok Nut Corp.**, New York City, appointed Lee N. Brittan Pacific Coast sales representative. He formerly was executive vice president of Waco Aircraft Corp. and president of Luscombe when it was at Trenton.

• **Solar Aircraft Co.** appointed Joseph E. Padgett director of Manufacturing at San Diego, and Leon T. Nosl budget director. New members of the board are Charles T. Leigh, a vice president of Consolidated Vultee, and Edward W. Goodwin, San Diego realtor.

Lockheed to Modify 50 Shooting Stars

Lockheed Aircraft Corp. has received a $7,500,000 contract for the modernization of 508 P-80 fighters, the largest order of this kind the company has received since the end of the war. Changes will give the A model some of the features of the P-80B, current production model.

Among the items to be added to the planes are: water-alcohol fuel injection, provision for jato take off, modified wing tips, rocket launchers, cockpit cooling and canopy defrosting.

Modernization of the planes will attain a rate of five a day in November, with the schedule calling for completion of the contract in March. All P-80As in the U. S. are included in the programs with 52 conversion kits to be prepared for P-80s overseas.

Briefing Production News

▶ **Consolidated Vultee Aircraft Corp.** has sold six Convair Liners to Sabena Belgian National Airline, for about $2,000,000, with deliveries scheduled to begin in Feb., 1948. Company now has orders for 171 Convair Liners.

▶ **Fairchild Engine & Airplane Corp.'s** personal planes division is now completely established at Strother Field, Winfield, Kan., and is in production of spare parts for the F-24, four place personal plane, and other Fairchild civil models.

▶ **Minneapolis-Honeywell Regulator Co.** has delivered the first unit of a $2,000,000 Air Force order for E-6 electronic autopilot control systems which will be installed on B-36 and B-50 bombers.

▶ **United Aircraft Corp.** has paid nearly $7,000,000 to employees under terms of group insurance policies since the inception of the first plan in 1928.

▶ **Lockheed Aircraft Service, Inc.** is now offering maintenance and overhaul service at its MacArthur Field, L. I. base for corporation-owned executive type aircraft.

▶ **Lockheed Aircraft Corp.**, effective Jan. 1, will extend its group insurance plan to provide coverage for an employee's entire family. Company will pay a share of the premium only for the employee.

▶ **Boeing Aircraft Co.** next week will sponsor a three day symposium on high altitude flight for U. S. and foreign air lines, for government, manufacturing and technical society representatives. Boeing, which for five years has carried on a major portion of AAF's high altitude research, plans the symposium as an exchange of information and experience on design and operation of pressurized aircraft.

▶ **Chicago Metal Hose Corp.**, Maywood, Ill., has received CAA certification for two types of Rex-Flex metal hose for use as fuel, oil, instrument and vacuum lines in aircraft.

▶ **Lamson and Sessions Co.**, Cleveland bolt and screw manufacturer, reports labor turnover as the lowest in its 70-odd year history and employment now at the same level as a year ago.

Pacific Airmotive Sets Up 10th Base

The tenth base in Pacific Airmotive Corp.'s continent-spanning chain of maintenance, repair and supply facilities has been established at Linden, New Jersey, eight miles from Newark, in the plant used during the war by Eastern Aircraft Division of General Motors.

Under direction of Gunnar Edenquist, vice president of PAC, the Linden Base already is doing work for Pan American Airways, Colonial Air Lines, Trans-Caribbean Air Cargo Lines, Scandinavian Airlines System and others, they are expected to make a strong bid for executive plane business.

One of PAC's main services at Linden, as it is at other branches, will be engine overhaul. Of 90,000 sq. ft. of space, 60,000 is occupied by the engine and accessory shop. Edenquist said overhaul of an engine a day will be achieved in the near future. For some time PAC has had a fixed price engine exchange plan.

Linden will also be eastern headquarters for PAC in its role as distributor of aviation goods. The company claims that more than 500,000 aviation items will be stocked, available to fixed base operators franchised as PAC dealers.

SABENA ON ILS

First commercial transport in Europe capable of making automatic airport approaches on ILS is the Sabena DC-6 currently touring European and African air routes. The Belgian ship—first DC-6 to fly the Atlantic—is equipped with the Sperry A-12 Gyropilot and Automatic Approach Control, as shown.

Hughes Radar Used

Colonial Airlines is making a test installation of Hughes obstacle warning radar equipment in one of its DC-3s and is expected to equip its entire fleet with this or a similar radar device.

Design Changes In J-33 Turbojet

Development program of Allison since AAF assigned engineering responsibility brings alterations resulting in higher thrust, longer life, lower weight.

By JOHN FOSTER, JR.

Boosting thrust by more than 40% and engine life by 300% while cutting weight by more than 7% and materially reducing cost in less than 2 yr is the record of Allison Div of General Motors Corp in producing J 33 type turbo jet engines (For complete Design Analysis of the basic engine, see AVIATION, Jan, 1946)

These improvements have been achieved by redesign of individual components and changes in production techniques started when engineering responsibility was transferred to Allison from General Electric original J 33 designers, who had been directed by the AAF to concentrate on the design of J 35s

Important design and production changes have been made throughout the entire engine, now designated by Allison as the model 400 The compressor rotor, for example, is becoming a completely new unit with half the original number of vanes yet capable of handling 20% more airflow with 10% higher efficiency

This new rotor is a 3 piece unit comprising a central forged impeller and two inducers, machined from smaller individual forgings and bolted to each face of the impeller Performance production and maintenance advantages are gained from this design, in addition to a major weight saving

By setting up the inducers as separate units, it is possible to get a more gradual turning of the air, with a resultant higher efficiency By using a thinner forging for the central portion it is possible to maintain better quality control and thus not only get more uniform products but reduce costs in rejected material and in overall machining time By having the inducer blades separate, damage to one blade does not mean a complete compressor rotor must be discarded, thus reducing spare parts inventories

At the same time lowering the number of blades has effected a 26-lb weight saving, with still more to be gained by changing from aluminum alloy to magnesium

▶ **Diffuser Changed**—A major change in diffuser design facilitates the production of a better component aerodynamically The new design is two-piece construction, replacing the old single casting The two pieces are now machined including vanes and turning elbows, then bolted together

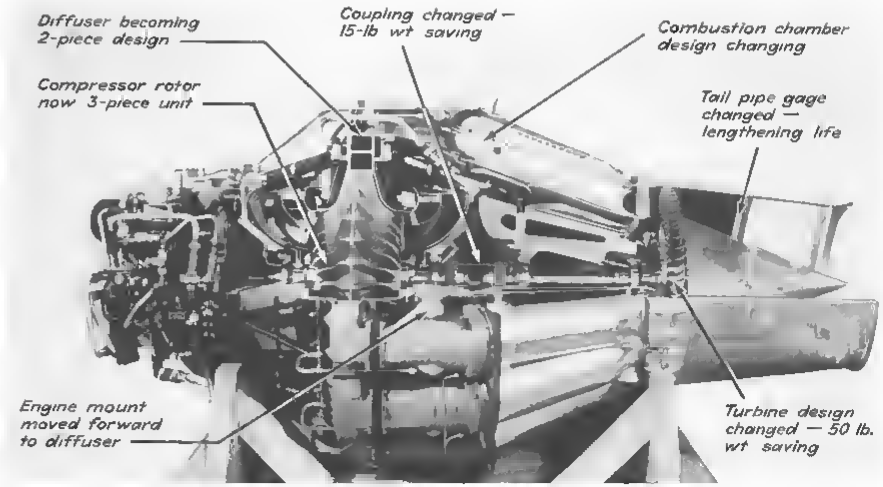
Combustion chamber design represents a constant change—which is still going on—with added efficiency and reduced pressure drop over present levels as the goal Size, number and position of louvres and holes in the chamber liner have been and still are being changed as a result of continuing research

Greater maintenance efficiency is resulting from a basic change in the design which calls for construction in two major subassemblies making it possible to remove any one chamber or liner without the rather complete engine teardown necessary in early models This change will call for close cooperation with airframe designers to insure the value will not be lost by building the plane without the necessary access panels

▶ **Life Lengthened**—Contrary to the general trend of weight reduction throughout the engine, current combustion chambers are heavier since Allison specified a 40% increase in thickness of both liner and chamber This small sacrifice in weight has been compensated by a 300% increase in life, combustion chambers today are often in better condition at the end of 150 hr of service than earlier units were at the end of 50 hr

Similar tripling of service life has been achieved by changing the alloy of the turbine nozzle diaphragm blades, and engine efficiency raised by production changes which call for welding the nozzle diaphragm inner band only along the rear face instead of both faces An additional change currently under way is aimed at raising both production and maintenance efficiency, for nozzle vanes and shroud rings are being made in shorter segments This means damaged vanes can be replaced quicker and from smaller spare parts inventories

Among the most important changes are in the turbine wheel, where a net saving of 50 lb and greatly reduced production costs have been achieved Most of the weight saving has been effected by taking off nearly



DESIGN DEVELOPMENT Typical of design and production changes made in J 33 engine by Allison Div, General Motors since engineering responsibility was assigned by AAF Result lower weight, increased thrust and life

PRODUCTION SPEEDER Massive butt welding machine attaches turbine wheel to main shaft in process aimed at higher output rate with better quality control Some 60,000 amp go through shaft and wheel which are of different alloys

BLADE SHAPER Instead of laboriously machining curvature into impeller blades, only fairly simple machining is done on vertical plane Then with impeller brought to high heat, it is placed in this 40-ton hydraulic press and blade shape is imparted by dies

¼ in from the rim on each face of the turbine wheel, with comparably shorter blade roots By thus thinning the wheel it has been possible to exercise more control over the forgings

Production cost cuts have been made possible by pinning the blade roots in place instead of the original peening process which required a groove along the rim Under current practice a small hole is drilled through what little rim is left into the serrations that retain the blade root Each root, in turn, has a small radial slot to match the hole in the wheel With the blade in place the pin is driven through the hole and hammered hard enough to bend it into the slot Removal of the blade can be done by simply shearing the pin

The pinning process has been found faster than peening, has cured blade shifting and simplifies turbine balancing This latter process has also been speeded by moment balancing all blades on a shop-devised scale As each blade is moment-weighed it is marked and stored according to its classification, so that when the turbine is assembled the blades are already well matched

On the splined turbine-compressor coupling Allison engineers have reduced weight by 15 lb and cut production costs by eliminating the double shoulder on each end

Some of the slight weight increases have been more than counterbalanced by a 10 to 15 lb saving brought about by simply eliminating the 14 tie straps which originally ran between combustion chambers from the bearing support assembly to the flange uniting the nozzle diaphragm and tail cone

▶ **Additional Weight Savings**—An additional 30 lb weight saving and elimination of two expensive forgings are made possible by moving the main engine mount attaching points forward 9½ in from the aft truss ring to a face being built into the diffuser

Unlike most weight saving changes made in reciprocating engines—which put parts under greater stress—the model 400 alterations have resulted in a more efficient engine with increased reliability and service life Specific fuel consumption has been reduced from 1.20 to 1.12 and production engines today are built to pass a 150 hr type test which may soon be increased. Dry thrust has been raised from a guaranteed 3,750 lb to an Army announced 4,600 lb Since water alcohol injection is known to boost power ratings by 20-25% the take off ratings of the model 400 can be assumed to be well over 5,000 lb, with 6,000 lb within the realm of possibility before the series is completed

Typical Changes Made in J-33 Design Development

Changes in J 33 17 from J 33 9 engine

1. Dzus fasteners provided on air scoop assemblies Facilitates installation & removal
2. Igniter plug sleeve ID increased to eliminate spark jumping
3. Igniter plug mounting holes offset to insure upstream air circulation in plug.
4. Governor was completely redesigned
   a. Gov weight system changed from spring type to flyball type for increased reliability.
   b. New weight system required oiling system
   c. Pilot valve more positively controlled
   d. Higher hardness on wearing parts
5. Barometric was redesigned
   a. Control valve bushing redesigned
   b. Lower bellows attachment redesigned.
   c. "O" sealing instead of gaskets.
   d. Bellows headers changed to steel.
   e. Button & plunger on control valve redesigned
6. Single lever control valve and support added to basic engine
7. Diffuser, front & rear truss rings changed from aluminum to magnesium
8. Compressor rotor changed to provide better balancing facilities
9. Stub shafts now provide flush fit to compressor impeller face
10. Accessories gear case now includes hydraulic pump drive.
11. Turbine bearing supports changed from aluminum to magnesium
12. Inner liner stack thickness increased to eliminate cracking. Radial support ribs and clips eliminated to prevent warpage. Extension added to transition cod to enhance cooling of ring & tube assembly
13. Inner crossover tube changed to "swastika" design to increase endurance life
14. Expansion joint on outer exhaust cone front flange Reduces warpage
15. Dome assys. contain "T" type dome brackets and facilities to support liner
16. All flexible piping.

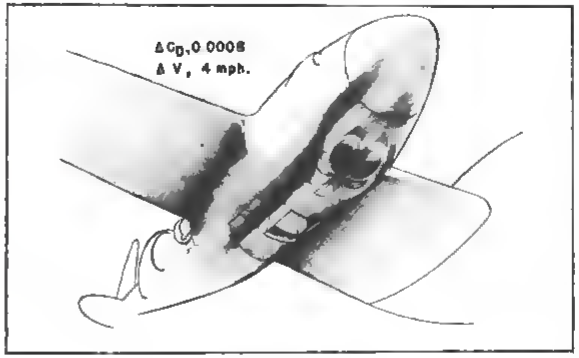
Changes in J-33 21 from J 33 17 engine

1. Air adapters changed from aluminum to magnesium
2. Water alcohol injection added
3. Shielded ignition added
4. Generator oil pump changed to gear type.
5. Eliminated tie straps.
6. Bellows type outer crossover tube added.
7. Two-piece tail cone blanket added
8. Cut back guide blade assys to enhance H_2O inject
9. Revised nozzle diaphragm Construction reducing distortion
10. Anodize accessory housing shafts to eliminate fretting and corrosion
11. Changed from peened turbine blade fastening to pinning

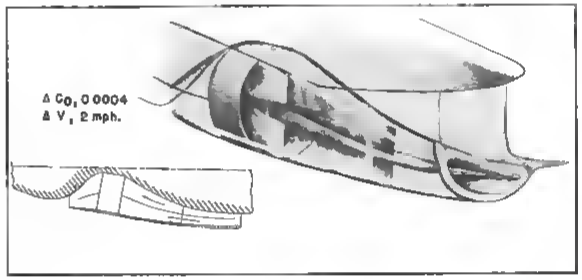
Searching Drag Studies Check Speed Impeders

For tV

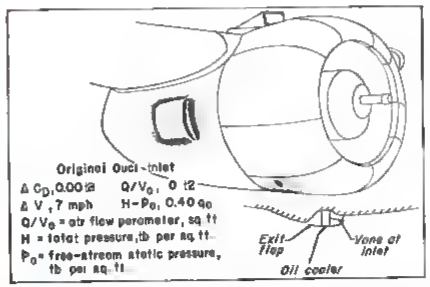
Detailed here are three more ducting modifications primarily intended to boos total pressure recovery—angular placement of oil cooler air inlet plane vane installation to reduce boundary layer separation and duct relocation. (Other ducting studies appeared on page 29 of July 28 issue of Aviation Week.)



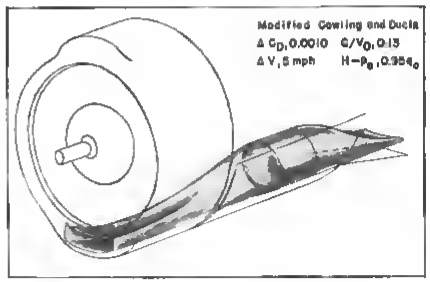
OIL COOLER AIR INLET on this craft was set at such high oblique angle to direction of airstream that flow tended to overron inlet. For airplane in high speed attitude average total pressure recovery at face of oil coolers was only $0.33q_0$ (q_0 is free stream dynamic pressure lb per sq ft.) Extending the lower lip of inlet forward so that plane of inlet would be more nearly normal to local airflow should result in recovery of most of available total pressure. Increment of drag coefficient shown in illustration is difference in drag of plane with both inlets and outlets sealed and unsealed.



VANES WERE INSTALLED in rear underslung duct of this installation to reduce pressure losses at radiator face as result of separation caused by thick boundary layer at inlet. Drag coefficient was 0.0004 less with guide vanes installed in diffuser and inlet than without vanes. Also, pressure recovery at radiator face was increased, by vane installation, from $0.69q_0$ to $0.83q_0$ at α_T (angle of attack of thrust axis) = 0.2 deg, and from $0.54q_0$ to $0.92q_0$ at α_T = 10.4 deg.



TOTAL PRESSURE RECOVERY measured at face of oil cooler of this airplane (left) for high speed condition was only $0.40q$. Low recovery was attributed to thick boundary layer at duct inlet. Drag resulting from ducts on both nacelles with outlets open for high-speed condition was 0.0018 greater than with ducts removed.



Full-scale tunnel modification to improve this installation is shown in illustration at right for which new oil-cooler duct was constructed having inlet flush with face of cowling, and gradually expanding diffuser. Result—total pressure recovery at face of oil cooler increased to $0.95q_0$, drag coefficient reduced by 0.0008.

Turbojet "Yardsticks" Checked In Flying Lab Tests

Four controlling studies are detailed in this analysis of prove-out procedures for jet designs.

By W. O. MECKLEY, *Aircraft Gas Turbine Div., General Electric Co*

Vital phases of a flying laboratory test program to evaluate a turbojet development are investigation of windmilling characteristics, thrust potentials, and burner blowout action. And instrumentation is a basic consideration. General flying test considerations were discussed in AVIATION WEEK, Aug. 11, pages 28 and 29.

Windmilling characteristics of a turbojet are important in their effects on altitude starting and drag imposed on the airplane. Test experience shows that windmilling speed of an axial flow turbojet is considerably higher than the centrifugal type (Fig. 1). It is desirable to obtain windmilling speed under different flight speeds, as, for example, in the case of one axial flow design, in which speed was sufficiently high so that operation of the starter was not necessary under all altitude starting conditions.

From Fig. 1, it may be observed that windmilling speeds are essentially independent of altitude, varying almost linearly with true airspeed of the plane.

Measurements should also be made of the drag imparted to the craft to determine whether shut off valves need be installed at the engine intake air duct to keep this drag within reasonable values in the case of a multi-engine plane, or in an installation where the turbojet is used as an assist power plant which is shut off at times to reduce power. In most tests thus far, the drag of windmilling turbojets has been high, indicating the need for shut off valves at the intake air duct when the engine is inoperative.

► **Instrumentation**—Recording of flight test data must be free of human error, and is usually accomplished by synchronized mechanical means—photo and/or chart recording in the space provided for instrumentation. Even under ideal conditions of comfort and space, as found in a wind tunnel test, manual data recording cannot compete with the accuracy and speed of a photo recorder. In an airplane, where working conditions are much worse, accurate analysis after the test has been run is almost impossible from manually recorded data.

In a flying test lab, photo recording allows flight and design engineers to observe and direct the test rather than be occupied with getting manual readings. If a multiplicity of photo recorders are used, all cameras must be synchronized to take pictures at the same instant, to properly correlate data.

Flight types of general service instruments generally form the backbone of an instrument set up. Manually balanced or adjusted instruments are ruled out with mechanical recordings. All instruments are usually of the direct indicating or automatically recording type. Manometers are acceptable for pressure readings in static operation, as in a wind tunnel, but for flight work the aneroid type of pressure gage has been found most satisfactory. Pressure taps and thermocouples to record the numerous readings in a gas turbine flight test are of the conventional type.

Degree to which an engine is equipped with instrumentation to record various temperatures and pressures, depends upon the specific installation and the vehicle in which tested. For example, two extremes in instrumentation would be typified by a type I-40 turbojet prepared for wind tunnel test, and the same engine installed in a hypothetical craft (Fig. 2). In a tunnel test engine, instrumentation is complete, while in the hypothetical craft no more than operational and overall instrumentation is employed. Two details of special interest, because of their uniqueness to this type of flight test power plant, is the determination of jet thrust and burner blow out.

► **Measuring Thrust in Flight**—The installation shown in Fig. 2 is generally representative of a typical single-turbojet fighter instrumented for flight test. It is important in such an installation to determine how the thrust at takeoff and in flight compares with engine performance established in factory tests. Most practical method is to determine jet thrust and ram drag in terms of gas flow and jet velocity, from measurements of exhaust tailpipe gas pressures and temperatures, airplane speed, and ambient air pressure.

Jet thrust can be expressed as the summation of the momentum or velocity thrust and pressure thrust. Momentum thrust is the summation of the products of all the pressure unbalances on the confining walls of the exhaust system multiplied by their respective increments of area—usually evaluated as the summation of the product of mass flow times velocity for each increment of jet area. Size of these individual jet area increments—each of which is assumed to be a uniform velocity field—is fixed by the number of instruments in exhaust path.

Pressure thrust is the force resulting from pressure drop from the jet nozzle throat static pressure (p_t) to ambient pressure (p_a) over the entire exhaust system surface. Nearly all of these increments cancel out, and pressure thrust is expressed as the sum of the products of ($p_t - p_a$) times the increments of nozzle area. Summing up the quantities described above, the expression for jet thrust is

$$F_j = [C_f A P_{tt} f_1 (P_t/P_{tt})] + C_f A (P_t - P_a)$$

where F_j is total, or jet thrust, C_f, thrust calibration factor, depending upon pipe length, etc., A, minimum hot area of jet nozzle, P_t, jet stream total pressure, P_{tt}, jet stream static pressure P_a, discharge ambient pressure, and f_1 indicates "function of" term in parenthesis.

Gas flow can also be expressed as a function of the cross sectional area of the exhaust pipe, static temperature, and total and static pressures in the pipe, as follows

$$W_a = \frac{A P_t}{\sqrt{T_t}} (f_2 P_t/P_{tt})$$

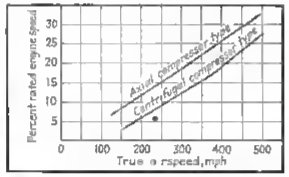


Fig. 1. Graph of engine windmilling speed vs. true airspeed—5,000 to 35,000 ft.

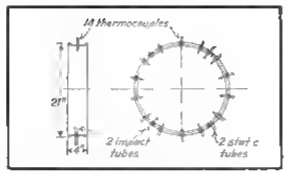


Fig. 3. Instrumented ring for jet thrust evaluation in flight.

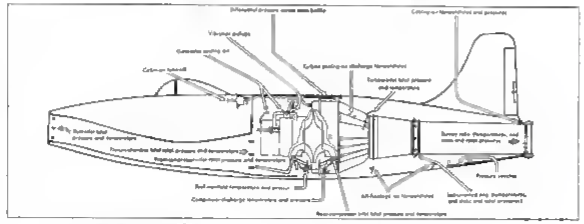


Fig. 2. Typical instrumentation in hypothetical aircraft installation.

where W_a is gas flow in lb/sec, T_s static gas temperature deg R, and f_2 indicates function of ' term in parenthesis.

Unusually, it is assumed sufficiently accurate to neglect the relatively small amount of fuel added to the air, and the same mass flow as measured at the exhaust end is assumed to represent the air flow entering the engine.

Ram drag resulting from air consumed by the turbojet unit is therefore

$$F_r = \frac{W_a}{g} V_p$$

where V_p is the plane speed in fps.

Net thrust available to the airplane for propulsion is

$$F_n = F_j - F_r$$

There have been several methods developed for determining, with sufficient accuracy, temperatures and pressures in an exhaust pipe. In general the number of instruments necessary or the complexity of the survey will depend upon the uniformity of the exhaust gas discharge flow pattern. Fig 3 shows details of one device used to determine the quantities of pressure and temperature, in flight, for evaluating jet thrust. This unit is an instrumented ring consisting of 14 thermocouples, 2 impact pressure tubes, and 2 static pressure tubes.

In general it is desired to have a single thermocouple survey one burner, so that the number of thermocouples installed will depend on the number of burners in the engine. Thermocouple readings are averaged to give the "indicated" gas temperature which has been assumed to represent static temperature plus six-tenths of the impact rise. Value of total pressure is taken as the average of the readings of the two impact tubes and static pressure is the average of the two static pressure taps.

Fig 4 illustrates another type of survey tool used extensively to measure thrust in jet flight where large gradients in exhaust gas discharge pressure and temperature exist, and where more elaborate surveying is desirable. This type of survey rake is usually located at the nozzle discharge and is mounted directly on the exhaust tailpipe.

Figs 5 and 6 plot, for comparison, thrust and flow calibration factors (C_f) from a series of tests of an I-40 turbojet, with four different exhaust tailpipes and utilizing both a nozzle discharge survey rake and an instrumented ring. Engine speed divided by the square root of the inlet air temperature is the abscissa. The higher values correspond to rated speed of the I-40 at sea level temperatures. The survey rake gives higher and more consistent readings than the instrumented ring in the case of the I-40, and, in general, would be the preferred method of instrumentation for this engine.

As observed from Figs 5 and 6, the type of pipe—degree of taper, length, type of jet nozzle, etc—has a marked effect on the calibration factors. Hence, it is generally recommended that the particular tailpipe used with the engine and either the jet nozzle survey rake or instrumented ring be calibrated together on a static test stand before flight testing.

Since these methods for evaluating thrust in flight are indirect by nature and involve calculations and somewhat variable calibration factors, there has been a decided interest in the direct measurement of thrust in flight—usually by ascertaining engine mounting trunnion forces as is done in static ground stands.

In most flight installations, space is not available to do the precise measuring job done on the ground. Most feasible scheme from an installation standpoint is the use of strain gages on flexible trunnion mounts, but because of temperature variations under changing conditions of flight, this has not proved completely practical as yet. Another scheme that has been proven on flying test bed installations is that of measuring thrust in terms of pneumatic pressure applied to a counteracting piston to prevent appreciable axial movement of the unit in the absence of an restriction. The installation shown in Fig 7 illustrates this principle.

Engine mounting trunnions, carried by two vertical arms pivoted in roller bearings at their lower ends, are also mounted in anti-friction bearings at the upper ends of the arms. Engine front support is similarly attached at both ends so that no force is exerted on the engine except in a vertical direction. Tailpipe and shroud are supported by ball bearing rollers in channels attached to fuselage, and thus, this entire unit—tailpipe and shroud assembly—would be free to move a short distance axially were it not restrained by the two pneumatic thrust pistons at the end of the triangular arms. These pistons are actuated downwards by air bled from the compressor discharge. Air pressure required to balance the thrust is then measured on a sensitive gage mounted at the operator's panel.

Whether the thrust reaction be measured by strain gages or pneumatic pistons the measurement will be net thrust, that is jet thrust minus ram drag corrected for effects of unbalanced static pressures acting across the unit and tailpipe, and any engine weight component along thrust axis.

▶ **Determination of Burner Blowout**—When a turbojet is throttled to reduce engine speed at high altitudes, some, or all of the burners may blow out and it may not be possible to restart the engine without descending to lower altitudes. Hence it is necessary to establish this lower limit of operation in flight tests of early engines.

One of the most practical methods developed to establish such a limit is by the installation of thermocouples in the engine exhaust tailcone, just aft of the turbine wheel. These units are installed circumferentially so that each thermocouple will effectively "see" the gas discharge temperature from a single burner. Each thermocouple is connected to a separate temperature indicator mounted on the operator's panel or in a photo recorder. A sudden drop in thermocouple temperature at once evidences the blow out of the corresponding burner.

There are some disadvantages associated with reading individual thermocouples to determine burner blow-out—inherent time lag in the thermocouple and temperature indicator, and unbalance of temperatures in burners, sometimes making it difficult to differentiate at the low speeds when a burner is near blowout. Hence, other schemes have been proposed, such as utilization of an electronic type flame detector and measurement of differential expansion of a burner inner tube with the outer tube.

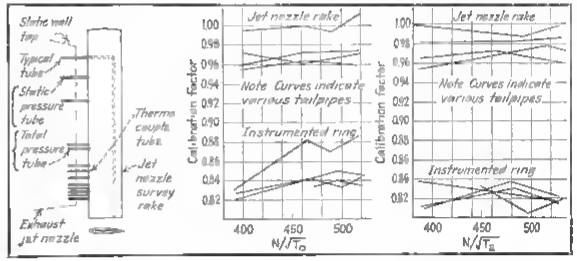


Fig 4 Typical jet nozzle survey rake installation. Fig 5 Chart of thrust calibration factors. Fig 6 Chart of gas flow calibration factors.

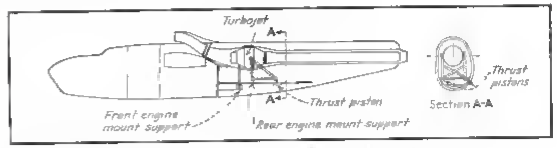


Fig 7 Diagram of flying test lab (B-24), with turbojet installed in thrust cradle

LINE MATERIAL

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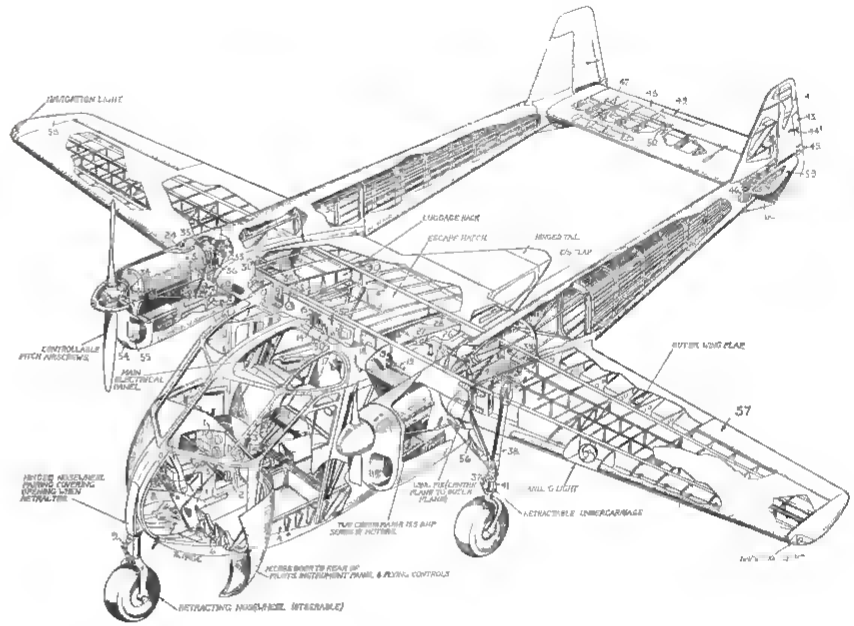
Sketchbook of DESIGN DETAIL



Portsmouth Aviation's Aerocar

Cutaway drawing reproduced through courtesy of The Aeroplane showing (1) instrument panel; (2) aileron control housing; (3) control column; (4) side beam; (5) rudder pedals; (6) rudder control layshaft; (7) nosewheel radius links; (8) nosewheel attaching casting; (9) nosewheel torque links; (10) nosewheel steering control; (11) fuselage keel; (12) elevator control; (13) flying control housing; (14) junction box; (15) electric cable runs; (16) suppressor, voltage regulator and cut-out; (17) fuel valves; (18) fuselage center section attaching point; (19) engine control runs; (20) cabin heater intake; (21) direct vision windshield; (22) magneto; (23) engine mount; (24) generator cooling air intake; (25) main landing gear radius links; (26) fuel booster pumps; (27) fuel gage; (28) and (29) 60-gal. fuel tanks; (30) vent pipe; (31) filler cap; (32) main gear wheel housing; (33) firewall; (34) prop operating unit; (35) starter; (36) air compressor; (37) landing gear torque links; (38) main gear strut; (39) upper attachment link; (40) landing gear retracing jack; (41) brake cables; (42) rudder; (43) trim tab; (44) tab control; (45) tail light; (46) rudder control cables; (47) elevator mass balance; (48) elevator; (49) trim tab; (50) control level; (51) emergency landing gear lowering lever; (52) emergency landing gear pressure gage; (53) warning horn; (54) exhaust manifold cooling air intake; (55) engine cooling air intake; (56) main gear radius rod; (57) aileron; (58) detachable tips; (60) reinforced posts for tail down landing; (61) 2.5 gal. oil tank. Prototype of composite wood-metal construction, recently made first flight.

Boundary Layer Control May Offer Safety Increase

Important gains in speed and lift forecast, with reductions in fuel consumption and stall tendencies.

Tremendous gains in aircraft performance and flight safety may be available soon through control of the boundary layer Among the forecast advantages are

Possible 25 percent speed increase in certain designs

Increase lifting capacity by approximately 100 percent

Estimated reduction of fuel consumption 32 percent

Reduction of stall tendencies

Reduced transonic stability difficulties

Increased rate of climb, higher ceilings

Greatly reduced takeoff and landing distance requirements

In addition to these performance gains boundary layer control offers a means of airplane control containing none of the adverse effects of present systems, improves flight characteristics of aircraft and provides a solution to the principal problem of the flying wing Research data are now available permitting the aerodynamic design of boundary layer control wings, control surfaces and complete airplanes Final obstacle in the path of its application are efficient mechanical systems to provide the control This problem is being attacked on a broad front in aircraft covering the complete size range Utilization of available data on internal flow systems[1] may make possible solutions to these problems and permit exploitation of the full advantages of boundary layer control systems This can be done either by sucking the boundary layer down into the wing through slots, by pumping a jet of air into the boundary layer or a combination of both

▶ **Pumping vs Sucking**—Tests have indicated that pumping air through a slot into the boundary layer is more beneficial than sucking but requires an expenditure of power three or four times as great as the suction system[2] Pumping may make possible a virtual "no stall" wing—tests carried to an angle of attack of 42 deg (beyond the practical range of flight or landing attitudes) failed to indicate a stalling tendency of the wing There appears little to limit the gains available through pressure boundary layer control, but results indicate a fairly well defined limit to the gains available through suction control Tests have shown that these suction gains reach a maximum above which additional suction proves fruitless The effects of suction are easily calculated through available data whereas pumping data is still inadequate for accurate computation[3] Low power requirements, insensitivity to slot shape, reduction in slipstream and decreased pressure and volometric coefficients render suction boundary layer control the most immediately promising method, according to present knowledge

▶ **Design Data**—Slots vs porous surfaces—Design data are available on single slots, multiple slots, screens and porous surfaces as entrances for boundary layer suction The use of a single, spanwise slot has proved the most economical and efficient[3] The range of flight speeds of the airplane can be increased by the use of several slots, although the number should be held to a minimum The use of mesh screens has proved expensive in power required and of reduced effectiveness Flight tests of perforated surfaces have proved inconclusive[4]

Slot location—The optimum location of the control slot is well forward for high angles of attack, at the mid chord point for a wide range of flight angles, and near the trailing edge for low angles (high speed condition) The highest lift coefficients have been obtained with the slot located on the after portion of the chord Extension of the laminar flow range of up to 12½ percent has been obtained through the use of multiple slots spaced about 0.05 chord apart[5] Effective control of the boundary layer on a high speed laminar flow section has been obtained through slots located at the 45 percent and 75 percent chord points[6] A promising arrangement is the use of retractable slot covers enabling the pilot to close the forward slot, for example, for high speed and open it during the landing approach On flapped wings, tremendous gains are indicated by the location of the slot on the flap, rather than on the wing[3] Compromise arrangement is the location of the slot in such a manner that it is sealed by the retracted flap and opened upon flap extension

Slot shape—An extremely narrow slot has proved most effective and a width of as little as 1/32 in appears best within a practical range of wing chords[3] Best design practice is a sharp leading edge and a smoothly rounded trailing edge slot To combat internal ducting losses, the slots should be tapered towards the tip, their wide edge nearest the tip, thereby removing the required additional air in the tip region[3]

▶ **Range of Application**—Transport aircraft, the use of boundary layer control on a transport aircraft in the 85 ton class could increase its speed 22 mph, increase its economy from 20 miles per gallon to 30 m.p.g., increase its range from 1700 to 2200 miles and provide 32 percent greater economy of operation than the same aircraft without boundary layer control[7]. A major advantage is the fact that the boundary layer control transport would require 21 percent less runway length

Jet aircraft—The use of the turbojet engine makes the jet aircraft admirably suited for boundary layer control The pumping capacity of the engine would permit the use of suction boundary layer control as an intake for the engine and the jet efflux as pressure boundary layer control[8] In addition, the low velocity boundary layer air could be accommodated by a turbojet engine with slightly higher compression ratio than that now in use[7] For transonic aircraft, stability problems could be minimized due to the virtual elimination of the turbulent wing wake through the use of boundary layer suction on the wing Through its ability to increase the lift of a wing, boundary layer control would render thin, high-speed wings more practical and provide a solution to the pressing problem of supersonic wing shapes at low subsonic speeds (during takeoff and landing)[8].

Personal aircraft—The creation of high lift coefficients and stall resisting characteristics makes boundary layer control ideal for personal aircraft At least one design is now in the preliminary flight test stage using boundary layer control not only for drag reduction but for control Continuous boundary layer jets are sealed off on the wing and elevator trailing edges, resulting in directional and longitudinal control of the airplane[9]. The application of boundary layer control airfoils of thick section with lift coefficients of the order of 5.0 or 6.0 will provide the lightplane with such slow, short-distance takeoff and landings characteristics as to make it competitive with the helicopter

Flying wing—Boundary layer control can effectively eliminate tip stalling, the basic problem of all wing aircraft[10] In addition, it will permit the use of extremely thick wing sections (30-40%) with the low-drag characteristics of conventional thin sections (10-20%)[8]. In addition, tests have shown that boundary layer control can increase the ratio of Maximum Lift Coefficient to Minimum Drag Coefficient by as much as 150 percent Since this ration is already approaching 200 with conventional sections, this would make possible ratios of 500 for airfoils alone and 400 for flying wing aircraft, which is twice the optimistic figure of J K Northrop[10]

▶ **Future Trends**—The power required to remove the boundary layer must be subtracted from the gain in drag to produce a true index of its efficiency. This indicates that the pumping or suction system must attain high efficiencies in order that boundary layer control prove practical Careful design of the internal flow system can reduce system losses to a minimum and obtain the full benefits of boundary layer control in drag reduction Improved flap design will increase the advantages of boundary layer control by translating boundary layer removal into greater lift coefficients More highly cambered airfoils will also achieve this greater gain The possibilities of extremely thick airfoils with reflex trailing edge need energetic exploration due to their tremendous promise as high lift low drag wings The immediate future should witness extensive flight tests of boundary layer control to determine its affects on stability and control, little data on which is presently available Research is immediately needed on the application of turbojet engines as power sources for boundary layer control in view of their rich promise over a wide speed range of this combination Increasing use of boundary layer removal for control on the series of Northrop flying wings appears assured as well as exploitation by the AAF of numerous radical all-wing designs impractical without boundary layer control. A new promise of boundary layer removal is its application to low turbulence wind tunnels in which it could provide 180° bends without the use of turning vanes and screens and preserved turbulence free flow

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Stinson Boosts July Deliveries Over June Total

Despite faltering production by several other personal plane companies, Stinson Division Consolidated Vultee Aircraft Corp, Wayne, Mich, has announced an increase in July deliveries of four-place Voyagers and Flying Station Wagons over June deliveries, with 230 planes delivered in July against 224 in June. The Convair Division since the end of the war has manufactured and delivered 3,228 four place planes, a total larger than the combined four place production of all other manufacturers, William H Klenke, Jr, General Sales Manager, announced

Airman's Guide Charts Hit In Commerce Economy Shuffle

Pilots pay more, get less under new status; packaged one-volume convenience, cumulative corrections out.

By ALEXANDER McSURELY

A Commerce Department "double shuffle" between CAA and the Coast and Geodetic Survey labelled officially as an economy move has seriously reduced the usefulness of the CAA Airman's Guide and will result in a higher cost to pilots, an AVIATION WEEK inquiry has disclosed.

For the past year the CAA Airman's Guide has been a one volume compendium issued in a new revised edition every two weeks and designed to give the pilot all the latest information necessary to fly his plane safely and conveniently. For this bi-weekly book 21,000 subscribers were willing to pay $7.50 a year.

▶ **Last Guide**—The last of these Airman's Guides has gone to press. From now on the pilot will pay almost as much ($6) for much less information. If he wants charts showing radio facilities such as were provided in the old Guide, he will have to pay an additional $4.50 to get the nearest substitute to those charts now available—the two-color radio facility charts issued by Coast and Geodetic Survey which will cost him an additional $4.50 a year.

Two factors enter into the Airman's Guide changes: an apparent departmental policy that C&GS handle the chart business exclusively, and a demand for a cut in CAA's Information Section as part of an overall CAA curtailment enforced by congressional budget slashes.

▶ **Problem of Money**—Whether it was better to turn the axe on the Airmen's Guide or on some of the CAA information sections profusely illustrated, brightly colored aviation books such as the new "Terrain Flying" volume, offers an interesting question. Deputy Administrator Frederick Lee has indicated that additional cuts may also affect such publications.

The Airman's Guide "new deal" offers the subscriber the old CAA Notice to Airman published every two weeks but now rechristened Airman's Guide. It includes no charts and no data pages. He will also receive a flight information manual and an airport directory published semi-annually. It has not been decided whether these will be combined as one semi-annual volume or published as two volumes. For this he pays $6 a year. Subscribers under the old Airman's Guide rate of $7.50 will have the unexpired portion of their subscriptions extended at the new rate.

Two items stand out as a distinct loss to pilots in the changes:

- The expiring Airman's Guide provided a cumulative correction of aeronautical charts so that a pilot could correct his old sectional chart merely by reference to the latest Airman's Guide, without going back through old issues.
- Charts in the Airman's Guide indicated all airports including approximately 4,600 which do not have radio ranges or towers. The two-color radio facility charts offered as a substitute do not show airports without radio and list approximately 600 airports.

The new plan for the Airmen's Guide resulted in a CAA information office salary curtailment estimated at approximately $30,000 a year.

▶ **Charts Described**—The C&GS radio facility charts were not started as a substitute for the Airman's Guide charts but have been supplied to airlines and other organizations requesting them since the first of the year. Printed in two colors on much better paper than was used in the Guide's charts and with only radio-equipped airports to show, they are regarded as a valuable aid by virtually all pilots of radio-equipped planes. It is estimated that the C&GS radio facility charts production cost would be approximately 60 percent greater than production cost of the black and white Airman's Guide charts. This does not include mailing costs which were handled by the Government Printing Office for the Airman's Guide.

▶ **Survey Shows Gripes**—A check of aviation industry and organization representatives in Washington indicated a dissatisfaction with the new arrangement, particularly because of the new setup's scant attention to small non-radio-equipped airports.

A spokesman for Aircraft Owners & Pilots Association said he thought the $4.50 price for the charts was "the best of a bad bargain," and pointed out that this figure had been reduced from an original suggested subscription of $9.00.

A Personal Aircraft Council spokesman voiced disappointment that the Airman's Guide had been curtailed instead of some other less essential CAA publications and suggested that the best solution would be for Coast and Geodetic Survey to publish the entire guide including the charts, so that it would remain in the handy one volume package.

CAA officials said they had been advised by the Government Printing Office that the price of the Airman's Guide was too low and would have to be raised perhaps to $10 or $15. This statement also was a factor in the changes.

PRESENTS FIRST AERONCA L-16A

Elmer Sutherland, Aeronca Aircraft vice president and general manager, recently presented the first of the 509 liaison planes designated L-16A, which Aeronca has contracted to supply to the Army ground forces. Presentation was made to Gen. James S. Stovell, chief of administration, Air Materiel Command, Wright Field.

Opens New Rest Haven for Tired Pilots, Planes

Service for airplanes and relaxation for their pilots is the salable double feature offered primarily for professional pilots of executive and company planes by the Dumbarton Lodge—Pilots Haven operated by C. V. Hopkins, Easton, Md.

Early this year Hopkins moved his National Airmotive Corp. from Baltimore to Easton airport, and purchased an estate on Chesapeake Bay, eight miles away, which he has converted to accommodate the pilots during their wait for their planes. The service includes complete inspection, repair and overhaul for executive aircraft plus lodge facilities for the crew, including quick laundry, meals and even icebox rubbing privileges, all at a single charge.

Hopkins knows the wandering life an executive plane pilot leads, because he spent several years as a pilot for P. K. Wrigley chewing gum manufacturer and Earl Halliburton, California mining and oil well supply manufacturer. Trips planned for days stretched out into weeks with ensuing laundry and hotel difficulties. Hopkins once bought 60 shirts because of laundry delays during a single extended trip. Whenever it came time for extended servicing of plane overhauls Hopkins spent his time in a hotel with taxi fares out to the airport to check on the plane's progress.

He is slanting the customer appeal of "Dumbarton Lodge" to pilots such as he once was who would welcome a chance for a few days vacation while their plane is being overhauled. And he points out that although there are a number of aviation country clubs being developed about the country, his is, as far as can be ascertained, the only one which caters exclusively to executive aircraft crews and which makes its complete maintenance and overhaul facilities a main attraction for patronage.

Centralization Affects CAP

Civil Air Patrol headquarters will be established at Mitchell Field, N. Y. under a new centralization plan which makes the volunteer patrol an auxiliary of the Air Defense Command of the Air Forces. Lt. Gen. G. C. Stratemeyer, ADC commanding general has announced. Brig. Gen. F. H. Smith, Jr., Air Forces officer assigned as national CAP commander will continue to have a CAP officer in Washington for liaison purposes. Currently the organization of private flyers includes 49 wing organizations, one for each state and Territory of Hawaii.

Principal activity of the senior patrol members is an aviation training program for CAP cadets, boys and girls 15 to 17 years old. Program calls for training of approximately 75,000 cadets.

Second WASP Reunion

Second annual reunion of the Women's Air Force Service Pilots (WASP) many of whom now are instructors or pilots for various civilian business firms, will be held at Ponca City, Okla., Aug. 25 to 27, on invitation of William T. Piper, president of Piper Aircraft Corp. They will be entertained at the Piper Ponca City assembly plant and by local civic organizations. The Order of Daedalians as the WASP alumni group is called, will conclude the session with a flight by many of the members to Cleveland to attend the National Air Races.

Stinson Dealers Aim At Over-35 Group

Stinson dealers and distributors have been instructed to find their primary sales prospects among persons over 35 years old, since this age group is indicated by surveys and studies, including one recently completed by CAA, to be the group most economically qualified to buy a personal plane.

To assist its dealers in maintaining up-to-date sales prospect files, the Stinson sales department is making available to them a combination prospect file and follow up with alphabetical filing of all sales prospects, and also an automatic follow up system on live prospects at periodic intervals. The follow up system files prospect cards by dates of next call or next contact by direct mail advertising, so that the salesman will be reminded to renew his selling effort on each individual prospect, periodically. The system has been "field tested" the sales department reports, to prove its efficiency, and has been developed in response to appeals from Stinson dealers for a prospect file.

Third Hoppicopter May Fly At Cleveland

The Seattle Pentecost hoppicopter, originally designed as a personal helicopter to be strapped on the back of the wearer, now has been developed into a new tripod version, Model 103, which has a more powerful engine, is larger and heavier and is expected to attain forward speeds as great as 90 mph.

Still a one-man lightweight device, the new Model 103 has a modification of the tripod landing gear used on the second hoppicopter, a more comfortable seat and major rotor modifications. It weighs 175 lb. as compared to 105 lb. for the earlier tripod version, has a 35 hp. engine instead of a 25 hp. powerplant and is 8 ft. tall instead of 6 ft. It is estimated to carry a useful passenger load of 250 lb. instead of 180 lb.

The two counter-rotating rotors have increased diameter 16 ft. instead of 13 ft. 6 in. and as an added safety factor have been spaced farther apart on the shaft amounting to 25 percent of the radius instead of 10 percent. Rigidity of the earlier rotor has been modified to allow a certain degree of blade "flapping" and to permit lighter rotor construction.

The tripod landing gear has been strengthened, and shock mounts have been installed on each of the three wheels.

Horace Pentecost, the inventor, estimates the new Hoppicopter will cruise for 60 to 90 minutes on 2½ gallons of fuel. A service ceiling of 12,000 ft., the same as for the earlier Model 101, has been fixed as about the maximum height any hoppicopter flyer would wish to attain in the "open air" flying machine.

FIRST PHOTO OF NEWEST HOPPICOPTER

New Model 102 of the Pentecost Hoppicopter, one-man helicopter, is undergoing tethered flight tests inside a hangar in preparation for a first public flight demonstration at the National Air Races in Cleveland, Aug. 30. Photo shows Maurice Ramme, test pilot for Hoppicopter, Inc., Seattle, seated in the new 102.

Versatile Helicopters Hoist and Patrol Lines

Two western helicopter operators Armstrong Flint Helicopter Co Los Angeles and Central Aircraft Inc Yakima Wash are using their Bell Model 47 B helicopters in a variety of special purpose jobs including power patrols and other assignments

The Armstrong Flint helicopter assignment to hoist three large electrically operated crosses up a Hollywood hillside for use in the Pilgrimage Play however is probably one of the most unique tasks which has yet come to the rotary wing aircraft It was estimated it would have taken six men a full eight hour day to get the material to the top But the material was divided into nine loads which the helicopter hoisted in 22 minutes Each cargo load was hooked to a 10 ft cable suspended from the helicopter which enabled the helicopter to rise to 10 ft altitude before it picked up the load It also made it possible for the helicopter to hover above the unloading stage while the equipment was being unfastened The unloading platform 22 by 4 ft was just below the summit on a narrow ledge and the operation called for precision flying to keep rotor blades from striking overhanging bushes and jutting rocks

The Los Angeles firm has also been awarded a four months contract for a test of the helicopter in powerline trouble shooting for the Los Angeles department of water and power Contract calls for 200 hr flying for $10,000 Low level powerline photography and visual inspection of tower insulators will be part of the test which will include a cost study in comparison with costs of other means of inspection

Central Aircraft Yakima has been awarded a contract to patrol and inspect by helicopter the Canol pipeline in northern Canada The helicopter will be taken by steamer to Ketchikan Alaska and then flown to Whitehorse Yukon territory and on to the Canol operation Tom Hall pilot expects to complete the patrol in 10 days to two weeks

Approximately 150 hrs of helicopter flying were logged recently by John Steen another Central Aircraft pilot in a recent three month experimental inspection contract for the Bonneville Power Administration The system contains about 3 000 miles of line strung over 2 400 miles of right of way in Washington and Oregon and the line runs through steep walled canyons and across great timbered areas Three inspection trips in three months were made by the helicopter patrol carrying a Bonneville lineman who checked the powerline from overhead and from 50 ft alongside or even closer to check broken insulators failing timber etc Leland F Murray superintendent of transmission maintenance estimates that the helicopter patrol does the job at about half the cost of foot patrols Decision of the Bonneville administration on whether to let a long term contract for helicopter powerline observation is being awaited

New Toledo Operation Plans 24-Hour Service

Walter R Crow Inc new aircraft repair and maintenance service which has leased property at Toledo (Ohio) Municipal Airport expects to operate on a 24 hour day basis the first operation of this type in the state the new company claims

The Crow operation will handle SOHIO (Standard Oil Company of Ohio) products and will offer complete maintenance and repair shop facilities for all private aircraft President Walter R Crow announced Maps fuel field repairs and local travel and weather information will be available at all hours at the base Contract has been let to Nesmith and Roberts Houston Texas for a steel prefabricated shop building 80 by 110 ft and construction has been started on a building to house service parts and restrooms More than $40 000 is being expended in the building program

SIGLER GETS BONANZA

Air minded Gov Kim Sigler of Michigan recently took delivery on a new four place Beech Bonanza at factory in Wichita Above Gov Sigler is shown (center) with Walter H Beech President (left) and Mrs Olive Ann Beech secretary treasurer when the plane was accepted

Calls Plane Farmer's Key to City Life

Describing the personal aircraft as the farmer's key to the city," John W Friedlander Aeronca President and chairman of the AIA Personal Aircraft Council recently told the National Flying Farmers Association "The presence of a plane out there on the farmer's own flight strip has served to completely wipe out the isolation which years ago was turning the footsteps of the average farm youth away from the land"

Addressing the NFFA annual convention in Stillwater Okla Friedlander pointed out "The continuing increase in farm flight will undoubtedly bring about a development not at first envisioned by your organization Ironic as it may seem to some of our city friends the fact remains that they are going to have to become progressive and up-to-date if they expect to enjoy your patronage in their economic life and your presence in their social life He believes that the flying farmer will fly up to 100 miles to a more hospitable city with close in airpark to avoid a nearby city with an airport five or ten miles out of town

William F Piper president of the company bearing his name described the personal airplane as "an important piece of utility equipment on the farm" and the answer to the World War I song question "How You Gonna Keep Em Down on the Farm? Before 2,000 members of the flying farmers of Prairieland Illinois Indiana Michigan and Wisconsin at Urbana Ill "For the city dweller Piper said "a plane is a luxury; on the farm it is gradually becoming a necessity"

Missouri Airport Progress

In the last three years 103 airports of all types have been added to the 28 designated airports in use in the state of Missouri on July 1, 1944, a report of the Aviation Section state division of Resources and Development has announced

Eugene Fryhoff head of the Aviation Section, points out that while some of these were fields which had been closed during wartime the majority were new fields developed to serve communities and for GI training The seven year national airport program calls for new airports or improvements to existing fields in 188 Missouri communities with 32 tentative allocations for Missouri airport projects made by CAA for 1947

A Memorial Airfield Act, passed by the Missouri General Assembly, which makes $250 000 available in amounts up to $10 000 to match community funds for airports, has already resulted in 29 communities receiving state grants, which will aid them in matching federal grants A total of 85 flying schools have been approved in the state for GI training courses

NAA Airport Awards

Inspection of airports for award of the National Aeronautics Association certificate of good operating practice has started Jerome Lederer, NAA Vice-President Safety Division has announced

Requirements have been revised providing credit beyond the basic safety requirements, for additional safety services for the private flyer, such as ground-to-air communication, good servicing, adequate transportation, etc Evidence must show that airports qualifying for the certificate have at least 50 percent of the additional "desirable items for safe operation," besides the basic minimum requirements

Last year 79 airports received awards Certificates are to be awarded at simultaneous dinners Dec 17 the 44th anniversary of the Wright brothers' first flight at Kitty Hawk, N C Approximately 20 other aviation groups in addition to NAA are co-operating in the airport safety campaign

Anchorage to Minneapolis

Lightplane flying between the States and Alaska soon will be commonplace That is the prediction of Ben B Edwards and Jim Tapscott, Anchorage, Alaska businessmen who recently completed a 3,565 mile hop from Anchorage to Minneapolis in a two place Swift

Flying time was 31 hours and 50 minutes Total cost was about $175 including gas and oil, food and lodging at Royal Canadian air barracks and a check of plane engine and radio at Edmonton, Canada

Edwards is with Shaw-Edwards-Goodman Construction Company, Anchorage, while Tapscott owns Air News Co, newspaper and magazine distributing firm, Anchorage

Cascade Emergency Fields

Washington State Aeronautics Commission has called bids for the first of several emergency landing fields authorized in the Cascade Mountains dividing the state east and west

First project is Baudera Field in Snoqualmie Pass about 14½ miles east of North Bend The field will be 2 400 ft long and 300 ft wide with turfed runway Other fields, designed to prevent mountain crashes which have been rather frequent in recent years are proposed

Parachute Delivery

Veterans Air Service of Grants Pass, Ore, has contracted with Richard Marvin, timber contractor of that city, to deliver supplies by parachute to lumber cruisers in the inaccessible areas northwest of the cities Contract calls for air delivery every eight days the first drop including 650 lb of foodstuffs and other supplies in 13 packages Phil England and Donald Kelley the operators use a Stinson Reliant in the service

BRIEFING FOR DEALERS AND DISTRIBUTORS

CROSSWIND WHEEL CERTIFICATION—Issuance of CAA approved type certificate No 179 for the Goodyear Aircraft Corp cross-wind landing airplane wheel puts the castering gear and the one-way airstrip in a new and more favorable light Up till now, all the castering gear developments have been strictly experimental Now CAA has put the stamp of technical approval on the Goodyear wheel as a safe and sound article for commercial sale. Goodyear currently is completing a study of production costs on the castering wheel, and if costs indicate it will be salable, it will be manufactured and marketed through Goodyear aviation products distributors Aimed at making one-strip landing facilities usable regardless of wind direction, the whole castering gear development promises to be an important single factor in increasing the utility of the personal airplane

LOW FLYING IN JERSEY—Legislative steps to curb reckless low flying in New Jersey, have been suggested as a result of airplane noise complaints at Madison N J A suggestion that the State Public Utility Commission be charged with regulating air flights, has been made to Gov A E Driscoll, who has indicated a study of "appropriate" legislation will be made for introduction at the next session of the legislature

SECOND AIRPHIBIAN—The No 2 Fulton Airphibian closely similar in most respects to the original prototype roadable plane announced last November by Continental, Inc., at Danbury, Conn, is starting CAA type certification tests at Danbury Airport Robert E Fulton, inventor of the plane and head of the company, and J M Dickey, general manager, are still awaiting further tests before committing the company to any production plans, despite good service test experience with the first flying auto both on the ground and in the air.

SKYWAY SURVEY—Survey flight for the proposed Skyway No 1 transcontinental airway for private flyers from Washington, D C to Los Angeles, is tentatively scheduled for early September with Los Angeles Chamber of Commerce and Washington Board of Trade officials participating The flight will take approximately 10 days including stops and checks of alternate airport facilities and community facilities for overnight accommodations of touring private flyers.

BONANZA AIRMAIL—Versatility of the four place Beech Bonanza is indicated in announcement that the Cuban army air force has taken delivery on five of the planes and is expecting to get four more—seven to be used in a feeder airmail network When the network is set up, all Cuban mail will be carried by plane, according to Lt Col Camilo Chavez Cuban air force chief, with army pilots doing the flying The Bonanzas will feed the mail into a main air line, and the Cuban postoffice system will use 60 jeeps to haul mail between airfields and postoffices. It is believed that Cuba will be the first nation to have an all-air mail system

FOR FUTURE FLYERS—Airport operators troubled by the younger generation, which insists on clambering all over available airplanes with resultant major damages to fabric and skin, can take a hip from the Laconia, (N H) airport, where a surplus B 17 flying fortress whose flying days are over has been parked behind a fence, specifically for the youngsters to play with They can get inside or on any part of the sturdy all metal plane, which probably gets as tough a "beating" in this assignment as any combat plane ever took Not every airport has a surplus B 17 or can get one but many airports have some kind of an old unairworthy airplane which will not be flown again, but which very well could serve such a purpose

REDWOOD EMPIRE—Enterprising promoters of resort and tourist areas are including aviation information in their data for prospective customers and smart airport operators will see to it that their facilities are listed in booklets and literature that go out from their areas Probably the neatest regional aviation promotion material of recent date in this line, is a folder being distributed by the Redwood Empire Association San Francisco, which maps 37 airports within the northern California-Oregon area included in the "empire," and lists information for flyers on the facilities of each airport

PRIVATE FLYERS LIMITED—Further indication that the annual winter migration of private flyers to Miami for the January Air Maneuvers will not be what it used to be this winter is seen in recommendation by S C Huffman, general manager of the Miami show Huffman recommends limiting private flyer attendance to "an invitational affair, or at least to such size as we can adequately control and handle" Gulf Oil Company, which for a number of years has sponsored an annual private flyers tour to Miami in January, coinciding with the date of the maneuvers, has indicated it may not again provide the free fuel and oil for the thousands of south bound private flyers this year, but will spread out its tour sponsorships in a series of state tours Observers for aircraft manufacturers after last year's show seriously questioned the value of the exhibition in promotion of personal flying and pointed out that the tour sent thousands of relatively unexperienced pilots south through serious winter weather hazards To offset the expected loss of the bulk of the private flyers, the Miami show this year proposes to set up a total of $66,500 in prize money for the various races and events

Alexander McSurely

How to Hold Cash, Pay Dividends Is Manufacturer's Current Problem

Questions by anxious stockholders may lead management to establish new dividend policy.

Contrasting dividend action by Grumman and Consolidated Vultee reveals the selective character of underlying conditions in the aircraft industry.

The investment public was taken unawares by the surprise announcement of the Grumman dividend of $1.50 per share payable Aug. 21, 1947. This followed on the heels of the Consolidated Vultee failure to pay the regular quarterly dividend due at this time.

Currently, few aircraft builders are showing profitable operations and are under pressure to husband cash resources. As a general rule most companies experiencing active production levels have substantial commitments in inventories and must finance such requirements through their own cash accounts, bank loans or a combination of the two. Such an atmosphere is not conducive to dividend disbursements. When bank loans prevail, there are definite restrictions against dividend payments for the protection of the debt.

▶ **Grumman Is Exception**—Grumman, thus far, has proven to be one of the exceptions to the general rule. The company is in a peculiarly strong financial condition with no inventory problem. Net working capital is currently estimated at around $40 per share. A production order from the Navy for the Bearcat (F8) is believed to assure the company of current profitable operations. Grumman is also unique in that it has shown profitable results every year since its inception some 17 years ago. Moreover, it has paid dividends in each of these years.

Another factor encouraging dividend payments, wherever earnings permit, is the revision of Section 102 of the tax regulations. This provision virtually makes mandatory payment of dividends out of current earnings if a company shows an unusually large working capital balance and has retained a large portion of previous years' earnings.

It is probable that Grumman may make another dividend payment later this year when final results become more clearly defined. This payment can easily be another 50 cents per share, thus equalling the $2.00 per share paid in 1946 and surpassing the $1.50 paid annually in the preceding four years as shown in the accompanying table.

▶ **Convair Dividend Small**—The Convair management attributed its action to the "uncertainties confronting the industry." The company paid dividends of 25 cents per share each of Feb. 20 and May 15 of this year. In the face of mounting deficits, however, dividend payments are most difficult to maintain. Previous 1947 payments were made out of surplus. For the six months ended May 31, 1947, Convair reported a net loss of $769,827 after giving effect to a $1,708,206 carryback tax credit and after charging $1,782,827 for experimental and development work. The continuation of the dividend payments would have meant an outlay of about $392,500 quarterly.

For a number of companies, dividend policy will be established in consideration of factors other than current earnings or immediate outlook. For example, there have been increasing indications of dividend stockholder groups who are prepared to sharply question certain management practices. Frequently, the best way to placate such groups and to divert their force, is to make regular dividend disbursements.

▶ **Stockholders Challenged**—The Bell management was recently challenged by a stockholder group but prevailed over the opposition. It is fair to surmise that the company may pay at least 50 cents per share this year. Bell showed earnings of 30 cents per share for the 13 weeks to March 29, 1947. Current operations in view of the extensive helicopter development are believed to be running at a loss. However, the company last showed a net working capital of more than $11 million. This financial condition can readily permit a minimum payment of 50 cents per share or a total of $217,395 on 434,789 shares of common stock outstanding.

Another company which may find itself in a tenuous position pertaining to stockholder criticism is Curtiss-Wright Corporation. Its off-again on-again dividend action on the "A" stock last year gave the management an unpleasant time and exacted the promise that it would not happen again. The company has a total of 1,158,702 shares of Class "A" stock which carries the non-cumulative dividend rate of $2.00 per share. It is quite likely that the annual payment of $2,317,302 in dividends may be made on this class of stock for 1947. This would remove one possible source of complaint from stockholders. On the other hand, it may be difficult to see a 50 cents disbursement this year on the common stock as was made during 1946. Such a payment would aggregate $3,715,165 and presumably would only be made if circumstances so dictated. The company's financial position would readily permit such payments.

▶ **United Should Maintain**—Similarly, United Aircraft may be expected to maintain the annual $5 dividend on its preferred share this year regardless if earned. This class of stock has been a source of contention among many shareholders. When this preferred was sold to the public early in 1942, investment sources are believed to have represented that this security would be retired shortly after the war as the proceeds were to be used to bolster the company's invested capital base to help finance war orders and minimize excess profits tax imposts. However, at the last annual stockholders' meeting they disclaimed any intention of retiring this preferred.

In the absence of special circumstances, reduced or omitted disbursements are expected to form the dividend pattern for the aircraft industry during 1947.

▶ **Dividends Discouraged**—Aircraft equities have always enjoyed their chief attraction as a possible medium for capital appreciation; they were rarely considered desirable vehicles for sustained dividend income.

—Selig Altschul

CASH DIVIDEND RECORD
(Per Share)

Representative Aircraft Manufacturing Companies

Company	1947 *	1946	1945	1944	1943	1942
Beech	nil	nil	$1.00	$1.00	$1.00	$1.50
Bell	$0.50	$2.00	1.00	1.00	2.00	4.00
Boeing	1.00	1.00	1.00	2.00	2.00	1.00
Cessna	nil	0.75	0.25	0.40	1.00	1.00
Consolidated	0.50	2.00	2.00	3.00	1.50	3.00
Curtiss-Wright	2.00	2.00	2.00	1.00	2.00	2.00
Douglas	nil	nil	0.50	0.50	0.75	1.00
Glenn L. Martin	7.50	7.50	5.00	5.00	5.00	5.00
Fairchild F. & A.	nil	nil	0.20	0.50	0.20	nil
Grumman	2.00	2.00	1.50	1.50	1.50	1.50
Lockheed	nil	1.00	2.00	2.00	2.00	2.50
Martin	0.75	3.00	3.00	3.00	3.00	1.50
North American	nil	1.00	1.00	1.00	1.00	1.25
Republic	nil	0.25	0.50	0.50	0.25	nil
United Aircraft pfd.	5.00	5.00	5.00	5.00	5.00	5.00
—Common	1.00	1.00	2.00	3.00	3.00	3.00

Note—*Total paid this far or ESTIMATED to be paid for 1947.

CAA to Continue Fight for ILS Omni-Range Airways

T. P. Wright admits ILS has operational bugs; fears government liability in GCA crashes.

Civil Aeronautics Administration plans to stand pat against a rising tide of congressional criticism over its VHF navigation aids program in the hope that performance of its instrument landing system during the coming winter will be good enough to make a strong talking point for funds when its budget for next year comes up for congressional scrutiny.

This year Congress eliminated all funds for further ILS installations and drastically slashed items earmarked for other bad weather flying aids on the ground. CAA had not properly coordinated its federal aircarrs program with military needs, necessitating a costly duplication of air navigation facilities.

▶ **Observes Skeptical**—CAA now has funding for 95 ILS installations but observers are skeptical of CAA's ability to get them installed and in working order before the bad weather flying season begins. A survey of ILS installations installed last spring indicated that few were operational.

T. P. Wright, CAA administrator, now admits that ILS has certain deficiencies and is subject to operational "bugs" under some condition but believes that with all its faults ILS is more suitable for commercial use than radar ground control approach. Among the operational bugs of ILS listed in a CAA report on the subject are:

- Terrain difficulties requiring careful positioning sometimes cannot be eliminated.
- Courses may be deflected by objects near transmitting antennae such as aircraft and motor vehicles.
- Certain localizer and glide path courses are not straight and therefore difficult to fly.

The CAA report claims that ILS is not affected by precipitation. However, the landing aids experimental station at Arcata, Calif., had so much trouble with ILS deflections from wet ground during and after heavy rains that it was necessary to lay portable steel landing mats to shield the radio signals from the wet ground.

CAA also claims that aircraft on the beam do not appreciably screen the beam from following planes but pilots who have air tested the systems offer considerable testimony to the contrary.

▶ **Clue to Objections**—CAA offers a clue to its strong objections to GCA in this report opining that "legal liability for improper control of aircraft by GCA units might fall on the government." Airline pilots using CAA experimental GCA units at Washington and New York have been highly critical of the controllers' abilities. In contrast to these operations the CAA GCA unit at Chicago has a highly efficient operating record and has already saved three aircraft that would have been unable to land without GCA.

Cost figures cited by CAA on GCA also seem high. CAA claims that a complete GCA unit including surveillance radar would cost $150,000 or about twice the current commercial market quotations on such equipment.

Commercial airlines are expected to be 100 percent equipped with airborne ILS localizer receivers before the bad weather season this winter. However airline pilots insist that the ILS localizer course be supplemented by compass locator stations. The pilots official attitude is that they can make all low approaches required using compass locator stations alone. It is generally conceded among airline operating personnel that the ILS glide path is too unreliable for regular use.

Wright scoffed at use of a radar airway as recommended by the Hinshaw Subcommittee of the House Interstate and Foreign Commerce Committee as not justified on ground of cost, power requirements and weight. Both Army and Navy are planning extensive radar airways on both coasts and along at least two transcontinental airways.

▶ **Pan Am Radar**—Meanwhile Pan American Airways which was instrumental in getting a GCA unit installed and approved for operations at Gander, Newfoundland, has arranged loan of an AAF search radar unit with a 100 mile range to supplement the GCA unit for long range traffic control at Gander. Indications are that the North Atlantic, key to profitable overseas operations, will be completely equipped with GCA before the bad weather season begins. Units are now operating at Gander, London, Paris, Iceland and Wilmington, Del.

Wright indicated that if Congress was willing to subsidize commercial installations of airborne radar, as the Hinshaw Committee recommended for national defense reasons that CAA would be glad to discuss such financing with the AAF and Navy. He agreed with the Hinshaw report that installation of both radar airways and the CAA sponsored vhf omni range systems are not justified. Wright pointed out that the United States and ICAO are already officially on record as favoring the VHF omni range program.

AID FOR CRIPPLED

Emergency delivery of a 6 ton drive shaft from Moore Drydock Co., Oakland, Cal., to Balboa, Canal Zone, was made recently by a Pan American Airways DC 4 after the car ferry S. S. Joseph R. Parrot broke down en route from the West Coast to Miami, Fla. The shaft, 27 ft. long and 12 in. in diameter, was lashed to a cradle, lifted to staging by a crane, and shunted into the plane's fuselage on rollers.

Air Migration Stirs Economic Problems

Uncertificated airlines flying the New York to San Juan route have been drumming up so much business that they are being accused of contributing to New York City's social and economic problems.

More than 2,000 Puerto Ricans are immigrating to New York City each month, a substantial number by charter and non-scheduled carriers which undercut Pan American Airways fare of $130 one way. As American citizens, the Puerto Ricans need no passport to enter the U. S. The great majority of them settle in New York City's crowded East Harlem area, which is now experiencing a marked crime wave and ever growing unemployment.

▶ **One Day's Total**—In one day this month, over 200 Puerto Rican migrants and tourists arrived at or departed from Newark airport by uncertificated airlines. It is estimated that 15 nonscheduled and charter operators make the San Juan run from either Newark or Teterboro.

While DC-3's predominate, one carrier, Trans Caribbean Air Cargo Lines, uses a DC-4 and makes the Newark-San Juan run nonstop. During June Trans Caribbean made eight round-trip flights on the route, achieving impressive load factors. Average number of southbound passengers on the eight trips was 40 and northbound 42.

With an eye on CAB enforcement of nonscheduled regulations, Trans Caribbean varied its operations with three trips to Rome and two to Athens during June. The carrier flew a total of 1,441 passengers 3,544,83 revenue passenger miles during the month and had gross revenues of $216,956. Trans Caribbean showed considerable expansion this spring, employes increasing from 64 in April to 86 by the end of June.

Other industry developments:

• **Air Freight Forwarder Association**, the ACR Transport Association, has filed a formal complaint with CAB against AFFA members who are "holding themselves out to the public" as indirect cargo carriers. ATA declared that some forwarders accept business from any shipper subject only to the limitation of their facilities. Such activity, ATA stated, falls within operations which CAB requires to have certificates of public convenience and necessity in accordance with the Board's Universal Air Freight investigation decision of 1945.

• **Robinson Airlines**, Ithaca, N. Y., has acquired three DC-3S which will be used on the carrier's intrastate run in conjunction with the present fleet of seven passenger Beechcraft.

• **Bonanza Air Lines**, Las Vegas, Nev., celebrated its first anniversary this month. Company has flown over a million passenger miles on its intrastate run to Reno.

• **Wayne County Airport**, Detroit, is being promoted as the city's principal cargo terminal by National Airfreight Forwarders. Arrangements have been made with county officials to establish a 24 hour-a-day cargo terminal operation at the field this month.

• **Nationwide Airlines** has started daily intrastate flights between Detroit and Houghton on Michigan's upper peninsula. Carrier is affiliated with nationwide Air Transport Service, Miami Springs, Fla.

EAL-Delta Argue

Final sessions of oral argument before CAB in the Boston-New York-Atlanta-New Orleans route case were highlighted by a Delta Air Lines charge that Eastern Air Lines in the past has made excessive profits but recently manipulated itself into the red to keep out competition.

Leslie Craven, Delta attorney, told the Board that Eastern had earned 80 percent on its investment for the 30 months ended May, 1942, and 60 percent for the 12 months ended May 1945. E. Smythe Gambrell, EAL counsel, said his company had lost $200,000 in June this year and between $600,000 and $700,000 in July when the load factor dropped close to 50 percent. He added that far from needing another carrier the Boston-New Orleans route is "chipping with service."

TACA Airways Loses $7,920,406 in 1946

TACA Airways S. A., Panama—incorporated holding company of TACA Airways System has reported a consolidated net loss of $7,920,406 during calendar 1946 against a $1,011,953 net loss in 1945. The 1946 deficit includes a $4,230,850 loss on investments.

Last year's consolidated operating revenues were $4,139,597 and operating expenses $7,678,928, leaving an operating loss of $3,539,331. These totals compare with consolidated operating revenues of $2,831,886 and operating expenses of $3,576,840 in 1945. The company's earned surplus deficit as of Dec. 31, 1946, was $10,007,881.

TACA's passenger business last year accounted for $2,114,840 in operating revenues, while freight and express revenue aggregated $1,225,737. Waterman Airlines, subsidiary of Waterman Steamship Corp., acquired management control of the company in January of this year.

"Alpha" Crashes

Three persons were killed and two injured in the crash of American Airlines radar experimental plane "Alpha" into Bowery Bay shortly after taking off from La Guardia Field on Aug. 8. Soon after becoming airborne, the DC-3 captain reported losing oil pressure in one engine and the craft failed to gain the field on the second attempt to make an emergency landing. Both the pilot and co-pilot were killed. The flying laboratory reportedly contained more than $100,000 worth of experimental equipment.

IAM Set to Capitalize On CIO Strike At Delta

Taking advantage of the tendency toward suicide of airline mechanics locals of the United Automobile Workers (CIO), the International Association of Machinists is back in the picture again at Delta Air Lines. During the abortive strike the UAW recently staged at Delta, the IAM first withdrew from a representation dispute and has now reinstated its application to participate in a mechanics' election.

Delta President C. E. Woolman reportedly is irked at CIO tactics and has refused to take back the UAW strikers—said to number around 200. Many of the strikers are ready to vote for any union which will regain their jobs for them, and the IAM is preparing to capitalize on the situation. Meanwhile, the National Mediation Board is pondering whether the strikers said by Delta to have been separated from service, will be allowed to vote if and when a representation election is held.

Lower Rate Increasing Overseas Airmail Volume

Reductions of up to 65 percent in foreign airmail rates last November are continuing to push volume higher, the Post Office Department reports.

Reaching a new peacetime peak of 409,158 lb. in May of this year, the average monthly mail load transported internationally by air for the six month period January-June, 1947 was 354,525 lb. In comparison, airmail bound overseas in October, 1946, last month of the old rates, totaled 202,438 lb.

NOAH'S ARK

Together with other inhabitants of Siamese, Indian and Malayan jungles these two baby elephants recently were flown from Bangkok to California in 60 hours by a Pacific Overseas Airlines DC-4. Also included in the $75,000 cargo were 15 Oriental bears, two leopards, 200 assorted apes and monkeys, 40 pythons, 20 cobras and more than 1,100 rare Oriental birds.

Private Pilot Blamed For Delta Accident

The accident in which eight Delta Air Lines officials were killed at Muscogee County Airport Columbus, Ga., last Apr. 22 probably was the fault of the private pilot whose BT-13 struck the Delta DC-3 as it was preparing to land, a CAB report on the accident states.

The Delta plane was on a route survey flight on a clear morning. It was making a proper final approach to the field at the same time the BT-13 was preparing to land. The pilot of the smaller plane did not see the DC-3 making its final approach and failed to fly a standard left hand traffic pattern around the airport. Instead, without keeping a diligent lookout for other planes, the private pilot made a long shallow right turn southeast of the field onto final approach for landing on the same runway to which the DC-3 was headed.

Upon completing its turn, the BT-13 was almost directly above the DC-3 and remained in that position during the remaining course of the landing approach, finally striking the Delta plane's empennage when the transport was 10 ft. above the runway. The BT-13 remained lodged in the tail surfaces of the DC-3 as it zoomed to 150 ft. and then crashed to the ground and burned. All occupants of the two planes were killed, including George Cushing, Delta's vice president-operations, who was pilot of the DC-3.

Spanish Plans Told

The Spanish airline Iberia (Compania Mercantil Anonima de Lineas Aereas) probably will use American equipment for its contemplated trans-Atlantic service to the U. S., according to the carrier's president, Rubio Paz.

CAB SCHEDULE

Aug. 28. Prehearing conference on TACA, S.A., applications for foreign air carrier permit extensions and amendments. (Dockets 301 and 2017.)

Sept. 2. Hearing in Latin American certificate Amendment cases of Panagra and Braniff. (Dockets 2527 and 2612.)

Sept. 3. Prehearing conference on Boston-Bermuda service applications by Northeast Airlines, Pan American Airways and Colonial Airlines. (Dockets 1650, 2212 and 2852.)

Sept. 8. Hearing on Mid-Continent's proposed service between Minot, N. D. and Regina, Saskatchewan. (Docket 688.)

Sept. 8. Hearing in Chicago Helicopter Service case. Extended from Aug. 18. (Docket 2384.)

Sept. 8. Hearing in case involving additional service in California-Nevada area. Postponed from Aug. 25. (Docket 2188 et al.)

Sept. 18. Hearing on CAB's investigation of TWA-Hughes Tool Co. relationships. (Docket 2786.)

Sept. 29. Hearing on Mid-Continent's application for alternate Kansas City-New Orleans Route. (Docket 1866.)

Oct. 7. Hearing involving additional Florida Area Service. Postponed from Aug. 12. (Docket 1668 et al.)

Oct. 20. Hearing on Pan American Airways application for route consolidations and extensions in Latin America. Postponed from Sept. 2. (Docket 2211.)

Nov. 15. Hearings on Board's investigation of Consolidated Airfreight Tariff Agreement. (Docket 2718.)

Play-by-Play

Visitors to the La Guardia airport observation deck will hear play-by-play Port of New York Authority announcements over a public address system describing varying activities at the field on Saturdays, Sundays and holidays from 3 to 7 P.M. Recent trial programs have been so favorably received by the public that the Port Authority has made the broadcasts a permanent feature of its airport service.

Victor H. Barden, the La Guardia information announcer and former control tower chief, translates for the spectators the radio instructions the tower is giving pilots on the field or aloft. He also reports on the origin and destination of flights and types and capacities of planes.

Franklin to Take Oak Ridge Post

John C. Franklin, TWA's vice president in charge of engineering, has resigned to become manager of the Atomic Energy Commission's Oak Ridge directed operations.

Active in air transportation since 1929, Franklin joined TWA in 1931 as superintendent of communications. He became vice president-engineering in 1942. With the Atomic Energy Commission, Franklin will administer plants at Oak Ridge which separate U-235 and the Clinton laboratories, which produce radioisotopes. The Oak Ridge, Tenn., office is to be activated Sept. 15.

Other personnel developments:

• **Air Transport Association**—Dr. R. V. Hobbah, former research economist with ATA, has been named chairman of the newly established department of transport of the School of Business Administration at Rutgers University's Newark, N. J. colleges.

• **All American Aviation**—Ernest H. Kingsbury, former assistant to AAA's chief engineer, research and developmental department, has become technical adviser to Flight Safety, Inc., Philadelphia.

• **American**—D. L. Bogart has been appointed cargo sales supervisor for the New York district.

• **Irish Airlines**—Warren H. Smith, formerly general sales manager of Northeast Airlines, has become New England district superintendent for the Irish carrier, which plans to inaugurate trans-Atlantic service early next year.

• **Pan American**—Jasper N. Barnette, Jr., superintendent of schedules for PAA's Latin American division in Miami, has become assistant to vice president Erwin L. Balluder, with headquarters in New York.

74 New Michigan Markers

Seventy-four Michigan communities have been airmarked in the current construction season, Walter J. Carr, air navigation specialist of the Michigan aeronautics department, reports, bringing the state's postwar airmarking total to 260 towns.

Discounts Help PAA Boost Spring Traffic

Pan American Airways has reported a systemwide traffic increase in the second quarter of 1947 which boosted revenue passenger mileage sharply above levels shown for the first quarter of the year and the second quarter of 1946. Plane miles flown also rose markedly.

Revenue passenger miles during the second quarter of 1947 aggregated 446,252,000, against 343,538,000 in the first quarter of 1947 and 280,183,101 in the second quarter of 1946. Plane miles flown increased from 22,524,638 in second quarter 1946 to 23,554,665 in first quarter 1947 and 25,139,041 in second quarter 1947.

The 20 percent vacation discount to Latin America effective May 1 has been helpful in raising traffic levels in that area, particularly on the long haul, according to PAA officials. Increases were especially noticeable on New York-Rio De Janeiro and Miami to Buenos Aires, Panama and Mexico City runs. Traffic on shorthaul trips between Miami and Havana and Miami and Nassau, neither of which was included in the summer fare discount, remained substantially the same.

Air Cargo, Inc., Opens Detroit Freight Terminal

First consolidated airfreight terminal for handling shipments over the certificated airlines was placed in operation this month by Air Cargo, Inc., at Detroit's Willow Run Airport.

The terminal has about 5,000 sq. ft. of floor space in a hangar. Similar units are planned by Air Cargo, Inc., the certificated airlines' ground service organization, in other key cities where growing cargo volume justifies the setup.

Meanwhile, Air Cargo, Inc., announced establishment of a regional office in San Francisco under J. P. Houghton, formerly with Eastern air lines and United Air Lines. Until other regional offices are established, Houghton's territory will comprise the entire area west of the Mississippi.

CAB ACTION

The Civil Aeronautics Board:

• Granted Northwest Airlines temporary exemption permitting service at Okinawa as intermediate point between Shanghai and Manila, and granted Pan American Airways temporary exemption permitting operation between Guam and Shanghai via Okinawa. (Dockets 1995 and 1062.)

• Denied Alaska Airlines request for temporary exemption authorizing cargo service between Anchorage, Alaska and Seattle. Docket (3001).

• Authorized Panagra to suspend service temporarily at Mendoza and Cordoba, Argentina, as intermediate points between Santiago, Chile and Buenos Aires.

• Approved transfer to Pacific Northern Airlines of Woodley Airways certificate of public convenience and necessity. (Docket 2827.)

Airmail Rate Boost Remains in Prospect

Post Office request for more funds may spark action next session of Congress.

A shortage of $16,795,000 in the Post Office Department's fiscal 1948 budget to meet estimated domestic and foreign air mail obligations of $104,295,000 (AVIATION WEEK, July 28) is expected to necessitate a request for additional funds from Congress next year, sparking off renewed demands for increased airmail postage rates.

In granting additional funds, members of the House and Senate Appropriations Committees, led by Sen. Clyde Reed (R., Kans.), intend to demand the rate increase. During the past session a bill raising airmail and other postal rates was reported out of the Post Office Committee but failed to obtain Rules Committee clearance for floor action, primarily because of a surge of opposition boosting newspaper postal rates. The legislation was sponsored by Chairman Edward Rees (R., Kans.) of the House Post Office Committee at the request of Reed and other members of the Appropriations Committees.

▶ **Revenues Decline**—A report by the Post Office Department, showing that postal revenues declined when the eight cents per ounce rate was reduced to five cents last October will be used by the Appropriations committeemen to buttress their demands for the airmail rate increase. The report discloses that:

• **Total airmail revenue** of the Post Office dropped from $14,662,864 for the quarter ended Sept. 30, 1946, when the eight cent rate was in effect, to $13,659,845 for the quarter ending Dec. 31, when the five cent rate was in effect.

• **Airmail volume** increased from 156,454,783 pieces during the third quarter to 214,219,322 pieces during the fourth quarter, but the Department's revenue per piece of mail handled declined from 9.372 cents to 6.377 cents.

▶ **Estimates Made**—In the first quarter of 1947, airmail volume fell off and the postal revenue dropped to $12,629,222 or 6.417 cents per piece of mail handled. Tentative estimates are that the postal revenue from airmail during the second quarter of this year will amount to $12,710,482—slightly more than the revenue for the first quarter but below the level during the period when the eight cent rate was in effect.

The Post Office Department estimates airmail obligations during the current fiscal year of $51,295,000 for domestic services (compared with $34,000,000 during the 1947 fiscal year) and $53,000,000 for foreign services (compared with payments of $27,262,000 last year). This year's anticipated foreign service obligations are allocated $30,640,000 for Latin American and trans-Atlantic operations and $22,360,000 for Alaskan and Pacific operations.

▶ **Supplemental Request**—The regular 1948 fiscal year Post Office supply bill allocated $37,000,000 for domestic airmail) and a token $5,500,000 for foreign airmail (provided before permanent rates on overseas routes had been set by CAB). A supplemental request of $14,295,000 for domestic services—primarily required to meet anticipated increases in payment rates to carriers—and $47,500,000 for foreign services was trimmed by Congress in its closing days to $10,000,000 for domestic services and $35,000,000 for foreign services.

All American Denied Passenger Service

Weighing safety considerations against the advantages of a new experiment in scheduled air transportation, CAB has turned down All American Aviation's request for temporary authority to carry passengers on a segment of its mail and property pick-up routes.

In making its decision, the Board recognized that All American had shown "commendable initiative and energy" in conducting experiments with the combined operation. But it added that the development had not reached the state where adequate assurance can be given that the high standards of safety requisite to all scheduled air transportation of passengers will be preserved.

▶ **Beechcraft Used**—All American had proposed using modified Beech D-18C aircraft for combination passenger and pick-up service on a 333-mile link between Pittsburgh, Pa., and Huntington, W. Va. The carrier has converted two of the eight-passenger Beechcraft by installing pick-up gear and mail bins in the area occupied by the four front seats.

While not contending that the converted D-18C is economical for the operation, All American has told CA that the plane is the best equipment now available. AAA said its experience in conducting demonstration runs and favorable passenger reaction to such flights had been convincing that the Beechcraft is sound and adequate for such service.

▶ **CAB Defines Position**—CAB noted that the D-18 has not been certificated by CAA for combination service such as proposed by All American. The Board said it has authorized services in the past which were experimental in their economic aspects, but also pointed out that it consistently has taken the position that it would be contrary to the public interest to authorize experiments where passenger safety is directly involved. "The type operation contemplated by All American requires frequent descents to low altitudes for property and mail pickups which would expose passengers to hazards which do not attend the flight of conventional aircraft," CAB concluded.

CONVAIR 240 WIDE OPEN NACELLE

New view of "orange peel" nacelle of Consolidated Vultee's twin engine transport, showing how deep engine is exposed by four piece enclosure for inspection and line maintenance. Note exhaust ejector stacks near top of engine

Largest Feederline To Start Service

Trans-Texas airways plans initial flights to eight points this month.

Second anniversary of Pioneer Air Lines' inauguration of the first certificated feeder service has found the nation's eighth short haul carrier in the process of activation.

Like pioneer, which as Essair, Inc., started flights between Houston and Amarillo in August, 1945, the new carrier, Trans-Texas Airways, will operate routes entirely within Texas. As shown in the accompanying table, Trans-Texas is the largest feeder set up by CAB. Its system of 1,824 route miles is nearly four times as large as that of the smallest feeder, Florida Airways, which has only 476 route miles.

► **Initial Service**—TTA has asked CAB authorization to inaugurate DC-3 service this month to Ft. Worth, Dallas, Palestine, Houston, Victoria, San Antonio, Brownwood and San Angelo, but first flights may be delayed until September. The Houston based carrier (certificated last November as Aviation Enterprises, Inc.) later will fly as far west as El Paso and south to Brownsville.

Meanwhile, complete statistics on the 15 feeders either certificated or designated for certification when adequate airports become available show that CAB already has laid out 19,099 miles of short haul routes. Of the 340 points placed on feeder links, 216 had not previously been granted scheduled airline service.

Average population of points on this short-haul routes—84,123—is considerably smaller than the average population of points on certificated trunklines. Bulk of the 216 points which will receive their first certificated airline service from feeders have less than 20,000 population.

► **Most Stops**—Wisconsin Central Airlines has the most stops on its routes, 34, of which 27 had not previously been designated for certificated airline service. Florida Airways, the smallest short-haul operator, has been certificated to only 10 points in the state.

Parks Air Transport, East St. Louis, Ill., has been designated to serve towns with the largest aggregate population—5,827,283. By contrast, the 15 points in Oregon, Washington and Idaho to which Empire Air Lines has been certificated have a combined population of only 282,776.

Average distance between feeder stops is only 55.5 miles. Summit Airways has the longest average hop, 101 miles on its Rocky Mountain links, while Wiggins Airways, Norwood, Mass., has the shortest average hop, 27.4 miles.

Cargolines File

Six more uncertificated carriers have applied to CAB for letters of registration granting rights to haul cargo on a common carrier basis pending determination of their route applications. The total is now 23. Latest to file are Eagle Air Freight, Burbank, Cal.; The Flying Tiger Line, Burbank; Riddle Aviation Co., Coral Gables, Fla.; Mercury Airlines, Port Columbus, O.; Standard Airlines, Long Beach, Cal., and Pacific Overseas Airlines, Ontario, Cal.

SHORTLINES

► **Air France**—Expected to begin occupancy of its 13-story building at 683 Fifth Ave., New York, last week.

► **American**—Flew 63,156 passengers out of New York on domestic flights during July, British civilians pulling out of India.

► **BOAC**—Has added two extra schedules per week between the United Kingdom and Canada to meet the heavy demand from against 59,430 in June.

► **Capital**—Recently signed a new agreement with the International Association of Machinists increasing mechanics' wages 15 cents an hour, providing for seven paid holidays, liberalized vacations, paid sick leave and an apprentice program. The union said about 700 employes covered by the pact would gain $385,000 during the coming year. Contract gives mechanics $1.71 an hour, inspectors and lead mechanics $1.89, lead inspectors $1.95, ground service workers $1.74, and maintenance helpers $1.24.

► **Eastern**—Has established a pension plan for all employes with three or more years' service. Effective Oct. 1, the plan calls for retirement of employes at 65, with the exception of pilots, who will receive the program's benefits at 60. The pension fund will be built by company and employe contributions.

► **National**—Expects delivery on its third DC-6 late this month. Company has increased its mechanical force by almost 125 since the first DC-6 was delivered in June.

► **Pan American**—Last week was scheduled to make a proving flight over a new Pacific link from San Francisco to Honolulu, Wake Island, Tokyo, Shanghai, Hong Kong, and Bangkok, with regular weekly service planned next month if CAA approval is granted. When the service is inaugurated it will replace the present route to Shanghai via Guam and Okinawa. It will also supplement PAA's route to Bangkok and Calcutta via Guam and Manila.

► **Piedmont Aviation**—Has become the 34th member of the Air Transport Association. The feeder based at Winston Salem, N. C., hopes to begin operations on some segments of its routes before fall.

► **Sabena**—Expects to place DC-6 equipment with sleeping berths on its trans-Atlantic run next month.

► **Trans-Canada**—During a recent month's survey found that 56 percent of its passengers from London to Montreal and 52 percent of its Montreal to London travelers were women. TCA carried 39,559 passengers on its entire system in June, against 38,110 in May.

► **United**—Is operating a record 200,000 plane miles daily compared with a pre-war high of 81,000 miles daily in 1941. Carrier is using 22 of its projected fleet of 35 DC-6s. Total planes on hand 121.

NEW AVIATION PRODUCTS

Raised Marker Lights

Elevated runway, strip, and taxiway marker lights, designed to meet latest CAA specifications L-802 for conversion of semi-flush contact lights, are in production at American Gas Accumulator Co., 1029 New-ark Ave., Elizabeth, N. J. Greatly increased

visibility over conventional semi-flush unit is reported. Full data is available from maker in relating to specifications and prospective installations. Distribution has been arranged through General Electric Co., Schenectady, N. Y.

Portable Two-Way Ventilator

Lightweight high-capacity portable ventilator, introduced by The Herman Nelson Corp., Moline, Ill., is designed to solve ventilating and cooling problems encountered in welding booths, paint spray booths, field repair shops and hangars. Use is also seen in airplane ventilation. Unit, mounted on light metal frame equipped with rubber

tired wheels, can be powered by either gasoline engine or electric motor. Standard equipment includes one 14-in. dia. by 16-ft. length extensible canvas duct for conveying air to desired point. Two-way air flow permits drawing smoke, dust, or gases from area or supplying fresh cooling air. Duct is specially treated for flame and moisture resistance.

Handy Kit for Float Repairs

Strip-A-Leak kit for seaplanes and amphibians is announced by Wiggins Airways, Metropolitan Airport, Norwood, Mass. Intended for use in emergency repairs of floats and hulls while away from regular repair facilities, outfit consists of adhesive in stick form for minor leaks including loose rivets, special adhesive to be heated in can for making major repairs, stiff bristle brush for applying adhesive and duck cloth patches of various sizes for use in the major repairs. Made up in small 14-lb. watertight package, kit may be shipped through hand hole of a float for stowage inside until needed.

Offers Two Anti-Rust Compounds

Two preservatives for normal rust prevention in the commercial and private aircraft fields are announced by **Shell** Oil Co., 50 W. 50th St., N. Y. C. 20. One is general purpose oil which gives approximately 200-day protection to parts stored indoors where rust conditions are moderate. Second is preservative to protect parts during long-term storage. This may also be used for external fittings of seaplanes and for control cables and similar applications within airframe. Application of compounds is by spraying, dipping or brushing.

Information Tips

Template Speed Dial Drawing

Drafting templets to simplify task of drawing dial indicators are being mailed to tool designers, draftsmen and tracers by **B. C. Ames Co.**, Waltham 54, Mass. Printed on 9½ by 8½ in. by 11 in. Bristol cards, templets give three-views of four sizes of dial indicators. Depicted are: Six dial graduations for each size eliminating necessity for dividing off dial markings; four popular backs (center and offset lugs adjustable post, and screw type); and also five most used types of contact points. Templet is merely slipped under drafting paper then indicator and details are traced in without resorting to use of scale or dividers.

Announces New Loran

Seaguide, a simplified Loran instrument to be available late this year or early in 1948 from **Industrial Radio Div. Philco Corp.**, Philadelphia 44, Pa., is new semi-automatic aid to aviation for use on transoceanic planes. Folder and literature issued by company states how instrument will give position of plane in seconds instead of minutes. Weighing 35 lb., instrument is 10 x 10 x 10-in. direct reading unit designed to receive signals from Loran transmitters at ranges up to about 1,400 nautical miles at night and approximately 750 nautical miles during the day. Improvement is accomplished on six frequency channels—four for present HF Loran shore stations and two LF channels for the new long-range transmitters now being developed by Government. Seaguide has two mechanical counters to indicate position of plane. Another feature is automatic frequency control (AFC) circuit permitting operator to line up signals without manual crystal phasing. Latter control, however, is retained in unit for emergency operation.

Roughness Measurement Detailed

Surface roughness measurement is subject matter of illustrated bulletin from **Physicists Research Co.**, 321 S. Main St., Ann Arbor, Mich. Giving suggestions on establishing a specification and control system, literature explains how Profilometer is used (1) to obtain positive check on roughness specifications in definite inch-to-inch units over any desired length of surface; (2) to shorten or eliminate production operations; (3) to detect impending dimensional errors before they occur; (4) to permit more accurate dimensional control and (5) to obtain a more consistent finish from calling tools.

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EXPERIENCED PROJECT engineer wishes new connection. Familiar with CAA and military requirements. Desires project or design position. Fully competent to organize and pursue project from conception to completion. Best references. Age 40. PW-1459, Aviation Week, 520 North Michigan Ave, Chicago 11, Ill.

AIRLINE TRANSPORT pilot 1050-2100 h.p. Army transport experience throughout Canada, Alaska, and the Aleutians. Airfreight airline experience in Canada, U. S. A. and Cuba. Character and ability references of the highest calibre. Age 37, married, one child. Any reasonable proposition from an individual concern or company offering the opportunity of advancement and security will be seriously considered and answered. PW-1485, Aviation Week, 330 W 42nd St, New York 18, N. Y.

MAINTENANCE ENGINEER—Specialist in aircraft engine and engine accessory problems. In aviation since 1928. Well qualified to handle varied positions due experience gained from filling key positions for aircraft manufacturer, engine manufacturer and airline. Willing to locate anywhere. PW-1487, 68 Post Street, San Francisco 4, Calif.

MECHANICAL ENGINEER age 32, 6 years aircraft compressor experience, four years general business, desires engineering position with aircraft accessory or durable goods manufacturer. Location metropolitan New York area. Available 60 days. PW-1500, Aviation Week, 330 W 42nd St, New York 18, N. Y.

HELICOPTER PILOT—20 years of age. Ten years experience in all types of flying. Graduate of Coast Guard helicopter school. Experienced on five different types. Available anywhere in thirty days. PW-1510, Aviation Week, 330 W 42nd St., New York 18, N. Y.

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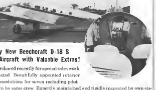

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AVIATION WEEK—AUGUST 18, 1947

SEARCHLIGHT SECTION

(Classified Advertising)

EDITORIAL

Keeping CAA Inspectors in Line

CAA inspectors who insist on mistreating the public are in for trouble. The United Pilots and Mechanics Association in Washington has announced it is starting a master file on every inspector "and certain other key personnel" to keep tab on their conduct.

In its latest news letters UPMA announces the plan to its thousands of members, who live in all 48 states.

"During the past three years we have received many complaints against actions of CAA inspectors in the field. Some were justified. Some were not. But in the cases which were justified a straightening out of the immediate complaint was all that could be done. CAA found that these inspectors did not have any other complaints in their personnel files, though it is known that in some cases numerous complaints have been lodged against some inspectors.

"Those inspectors need more than a light reprimand. They should be demoted or removed. But their personnel files are bare."

It is the contention of the top authorities in CAA that they are powerless to remove employes of civil service standing unless certain grave charges can be proved. One key to the problem is the rating system. An inspector in the old guard circle has friends in the right places. He can usually be assured that there will be nothing but favorable ratings filed in the first place, or that unfavorable ones will "disappear" from the files. This may sound rather theatrical to the naive and unsuspecting public but it is common practice in some offices in CAA.

However, UPMA believes that hereafter, when occasion arises to challenge an inspector's actions, "we will be able to cite instances without revealing the source of information and thus help CAA cut out the dead wood in its organization, under civil service rules."

A minority of inspectors have aroused public complaints. It would be unfair to criticize the majority. The minority, however, know very well who they are. In the past the suffering public has been at their mercy. There were too many subtle but extremely effective methods of revenge on any poor individual who dared to complain about inspector treatment. The CAA old guard are past masters at spite work, but never on paper. The slow down treatment is a favorite. Certifications strangely fail to clear or renewals become "lost," applications are held somewhere because the victim made technical errors in filling them out. Or there are numerous repeat examinations between long intervals because the individual doesn't quite satisfy the inspector. The old game works as effective on fixed base operators as on the unsuspecting pilot. Here, however, the stakes are larger and it pays the operator to do a certain amount of business "entertaining" or gift buying, in one form or another. The operators who meet these obligations seem to have least difficulty with CAA. The small operators with least money to expend frequently seem to have most difficulty.

The inspector problem last hit the headlines in 1944, when two editorials in AVIATION NEWS brought a national investigation by the then new Administrator of Civil Aeronautics, T. P. Wright. Mr. Wright sent copies of the editorials to every regional office of CAA, with instructions for each inspector to comment as he saw fit. Later, a definite effort was made by Mr. Wright to instruct inspectors in certain aspects of public relations. There was a noticeable decline in complaints as sincere personnel sought honestly to improve their service to the public, and the unreconstructed FBI type inspectors waited for the heat to go off.

Recently, complaints have been heard again, and with certain discouraging signs of a return to power of the old guard factions in CAA, we feel the UPMA nation wide file is as well timed as it is ingenious. We hope that fixed base operators, pilots, mechanics and plane owners will take advantage of this opportunity to weed out obnoxious and incompetent inspectors. For the first time, the public has an opportunity to report such personnel without fear of reprisals, for all names of complainants will be kept confidential by the association.

UPMA has the largest fixed base operator membership of any group in the country. Furthermore, thousands more of its members are plane owners, pilots and mechanics. We shall await the public response to this innovation with keen interest. Conscientious inspectors have nothing to worry about. The others must look ahead to uncomfortable nights as they wonder which of their victims are writing complete reports to an independent association office in Washington. For once the worm has turned.

It seems to us that it would be a public service after six months for UPMA to release the names of the inspectors responsible for the largest number of complaints. If UPMA sees fit to issue the results of this unpopularity poll, AVIATION WEEK will print them.

ROBERT H. WOOD

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